

THE IRON AGE

New York, Thursday, April 14, 1910.

The Southern Supply and Machinery Convention.

Closing Sessions of Manufacturers' and Dealers' Meetings at Jacksonville, Fla., April 5, 6 and 7—A Better Understanding Between Manufacturers and Dealers.

The joint convention of the Southern Supply and Machinery Dealers' and the American Supply and Machinery Manufacturers' associations at Jacksonville, Fla., which came to an end on the afternoon of Thursday, April 7, brought about mutual understandings between the participants on a number of mooted questions that have been giving both the manufacturers and dealers some troublesome thought.

The two associations held separate executive meetings during the three-day meeting, at which they discussed their individual sides of the trade questions at issue. At the joint meetings the sentiments expressed at the separate executive sessions on both sides were briefly recounted, and these meetings resulted in a frank expression of tacit understanding covering certain phases of trade agreements. Neither of the associations at its separate meetings adopted any stringent resolutions nor did it take such a positive stand on matters at issue as to cause any friction. There is no doubt, however, that the convention will result in better mutual understanding, and in the forthcoming contract renewals between manufacturers and dealers changes will be made, in many cases, that will be a benefit to both parties.

The First Day's Sessions.

The proceedings of the Tuesday morning session, when the convention was opened with a joint meeting, were reported in last week's issue of *The Iron Age*. The separate executive meetings of Tuesday afternoon were given over largely to organization matters, but at the manufacturers' meeting a rather important step was taken when a committee of three members was appointed to set a date and select a place for the next convention of that organization. The Southern Supply and Machinery Dealers' Association and the National Supply and Machinery Dealers' Association are advised of this action and requested to appoint similar committees to act in conjunction with this committee. The manufacturers also paid a tribute to the late Charles F. Aaron of the New York Leather Belting Company, who was formerly president of the organization. John Trix, president of the Manufacturers' Association, called upon the members to arise and stand in silence for a few moments in tribute to the memory of Mr. Aaron, who was one of the foremost members of the association, and this was done.

Mr. Trix, who represents the American Injector Company, Detroit, Mich., reminded the members that in their debates it might be well to consider the question of limiting their profits as much as is consistent with the view of considering matters from the standpoint of the consumer. "Let us not overtax the man," said he, "who is able to make one blade of grass grow where two grew before." Mr. Trix also advised the members to give proper consideration to the safeguarding of their workmen. In this connection he said: "Every year we maim and kill more people than there are in the entire city of Cincinnati, and we can take some lessons from German manufacturers on the subject of safeguarding our employees. Last year we killed more men in football than Germany did in her entire iron industry. Let us be careful lest we are rightfully called the slaughter pen of the world."

The Manufacturers' Wednesday Morning Session.

The Manufacturers' Association got down to business at the Wednesday morning session. President Trix was a pleasing revelation as a presiding officer, his methods of conducting the sessions being decidedly original. During and after the reading of a paper on "Mutual Obligations Under Exclusive Agents' Agreements," by Charles T. Page of the Page Belt Company, Concord, N. H., which was presented on page 814 of *The Iron Age* of April 7, the usual quota of straggling late comers entered in twos, threes and squads. When the paper was concluded the president rounded up the tardy ones and told them that they were attending the meeting of a business organization and should make it a point to attend on time. He rebuked them in a jocular manner, threatening to fine them, but the meaning was there nevertheless and the hint was taken, as the ensuing meetings were promptly attended by the majority of the members. There was but little discussion on the paper presented by Mr. Page, which seemed in the minds of the members to cover the question, and it was accepted as their sentiments.

WHO SHOULD PAY FOR DEALERS' CATALOGUES.

The next question taken up was "Should Manufacturers Pay for Representation in Dealers' Catalogues, and, if so, to What Extent?"

In discussing the matter, the president stated that the experience of his own company in paying for advertisements in dealers' catalogues had not been very satisfactory. He stated that he found on investigating a request from one dealer to the effect that he invest \$100 in catalogue advertising in the dealer's book that the latter had only sold \$59 worth of his goods within two years. He also told of another man embarking into the jobbing business who as a preliminary got up a catalogue, securing \$1600 worth of advertising in it. "That man," the president said, "has nothing at stake and \$1600 in sight and everything to gain, even if he goes to the wall."

Another manufacturer complained that dealers frequently take manufacturers' names off cuts loaned them for use in catalogues, which enables such dealers to substitute other goods when they find it advantageous. He held that jobbers and dealers who ask for money contributions for their own catalogues should not be encouraged, and declared that most of the first-class jobbers were perfectly satisfied to pay for their own catalogue printing. In his opinion the manufacturer is doing enough when he furnishes the jobber with plenty of printed matter gotten out by the manufacturing company.

Another said he did not like the arrangement of paying for representation in a jobber's catalogue, because it encourages jobbers to get out books that are not fitted to the usual situation. "Is the jobber's and dealer's catalogue comprehensive," the speaker asked, "when you can buy as much or as little space as you like regardless of the relative importance of your product as compared with other less advertised material? More often than not, inferior articles are given the most prominence and the customer frequently takes the great display of advertising as a recommendation of worth from the jobber and acts accordingly. This

is misleading to the customer. There ought to be some semblance of truth about a jobber's catalogue, and as the dealer gets it out in the interest of his own customers, he ought to pay for its printing and distribution."

THE "READY MADE" CATALOGUE.

Another member said that years ago the jobbers were glad enough to obtain the loan of cuts and electrotypes, and they seldom came back. Now they not only ask for cuts, but demand pay from the manufacturer for showing his goods. He added that publishers who turn out ready made jobbers' catalogues frequently put the dealers up to soliciting advertising and then take the pains to remove the manufacturer's name from his cuts.

A representative of a catalogue printing house stated that these practices did not by any means apply to reliable concerns such as he represented, and invariably in any legitimate catalogue the only cuts shown without names attached are illustrations of such standard articles as chain belt links, cordage, cut gears and the like.

Another member claimed that the average manufacturer does far more for the jobber in the way of furnishing advertising matter than he has a right to expect. "I know," he said, "that our house supplies dealers with a great deal of printed matter in the way of expensive catalogues and the like, and we often go so far as to mail matter to people on dealers' lists, thus drumming up the business for the dealer at our own expense. Some men start in the dealers' business and have no stock whatever, and they obtain from the manufacturers a large amount of expensive printed matter. In such cases they get out catalogues at the manufacturers' expense that are by far bigger than their business. We have solved the problem of contributing to the expenses of printing dealers' catalogues by offering dealers who approach us on the matter a liberal advertisement, provided their account is increased \$2000 during the year, and we deduct 5 per cent. from their commissions until we are repaid for our advertising." In cases where two accepted this proposition, the manufacturer added, neither one of them came back.

President Trix concluded the discussion by stating that the next jobber that approached him on the matter of contributing to his catalogue will hear of the 5 per cent. proposition.

The Dealers' Wednesday Morning Session.

At the dealers' Wednesday morning session E. Howard Smith, vice-president and general manager of the Bluefield Supply Company, Bluefield, W. Va., read a paper on "Employment of Salesmen on Commission or Profit Sharing Basis," and in the discussion which ensued it was apparent that most jobbers favor the offering of such incentive to salesmen. Because of the confidential nature of some of the examples given by Mr. Smith in his paper, it was decided not to make it public. The general sentiment was that in most cases the plan of offering salesmen a commission rather than limiting them to a set salary is productive of the best results.

In a discussion on "Experience with and Benefits to Be Derived from Local Organizations," a number of dealers spoke of advantages they had experienced in such connections. It was declared that, regardless of the fact that selling houses which refuse to participate in the expense of conducting an association which is operated to their benefit manage in many cases to participate in the good things that such organizations bring about, the suggestions and discussions at the association meetings from which outsiders get no benefits are frequently of incalculable value.

Wednesday Afternoon's Joint Meeting.

Wednesday afternoon was given over to a joint executive session of the two associations. W. P. Simp-

son, of the C. T. Patterson Company, New Orleans, La., spoke briefly on "What Advantages Have Been Derived by the Adoption of Resale Prices and Should Same Be Continued by the Jobbers?" He argued that they certainly should be continued. Other dealers spoke in the same strain. Attention was called to the fact that when manufacturers sell to unreliable dealers the latter frequently cut the prices on one product with a view of influencing sales of other material. The dealers held that in such cases the sale is a poor advertisement for the manufacturer whose goods have been sold at a knock-down price, as when the purchaser is in the market again there is no inducement for a similar reduction and he is liable to refuse to pay the advanced price quoted him and go elsewhere for his material. It was adopted as the sentiment of the dealers that they would favor selling the goods of manufacturers who make a fixed minimum price below which goods cannot be sold. The dealers also advocated that they be allowed a 2 per cent. cash discount.

N. A. Gladding, vice-president of the E. C. Atkins & Co., Inc., Indianapolis, Ind., gave experiences of his firm in a paper entitled "Practical Results of the Adoption of Resale Prices."

Thursday's Proceedings—Election of Officers.

On Thursday morning the associations held separate sessions and elected officers. At the manufacturers' meeting the report of the Nominating Committee was adopted and the following officers were elected:

President, S. B. Browning Ohio Valley Pulley Works, Maysville, Ky.; first vice-president, H. P. Lupton, Oliver Iron & Steel Company, Pittsburgh, Pa.; second vice-president, D. K. Swartwout, Ohio Blower Company, Cleveland, Ohio; third vice-president, J. H. Cobb, New York Belting & Packing Company, New York. Executive Committee: Willard Parker, Pennsylvania Shafting Works, Philadelphia, Pa.; W. H. Fisher, T. B. Woods' Sons Company, Chambersburg, Pa.; J. E. Osgood, J. M. Carpenter Tap & Die Company, Pawtucket, R. I.; E. A. Ludden, Detroit Oak Belting Company, Detroit, Mich.; Chas. E. McFarlan, William Powell Company, Cincinnati, Ohio. Member of Advisory Board to succeed the late Chas. F. Aaron, N. A. Gladding, E. C. Atkins & Co., Inc., Indianapolis, Ind.

John Trix, the retiring president, was presented with a gold headed cane, and a number of members took occasion to refer to the fact that the gift was appropriate, because of the "big stick" methods he employed in assuring prompt attendance at the meetings.

The Dealers' Association elected the following officers:

President, H. C. Clark, Charlotte Supply Company, Birmingham, Ala.; first vice-president, R. B. Lebbey, Bailey, Lebbey & Co., Charleston, S. C.; second vice-president, W. G. Thomas, Pidgeon-Thomas Iron Company, Memphis, Tenn.; secretary and treasurer, Alvin Smith, Smith-Courtney Company, Richmond, Va.; member of Manufacturers' Conference Committee, William Banks, Banks Supply Company, Huntington, W. Va. Executive Committee: J. A. Riechman, Riechman-Crosby Company, Memphis, Tenn.; J. G. Beldon, Lombard Iron Works & Supply Company, Augusta, Fla.; W. P. Simpson, C. T. Patterson Company, New Orleans, La.; J. C. Fischer, Alabama Machinery & Supply Company, Montgomery, Ala.

The Social Features.

The social features of the convention were looked after by a joint entertainment committee. The members for the dealers were as follows: J. G. Christopher, chairman, J. G. Christopher Company, Jacksonville, Fla.; W. E. Gerow, Atlantic Supply Company, Jacksonville, Fla.; W. M. Ross, Georgia Supply Company, Jacksonville, Fla.; H. E. Ploof, H. E. Ploof Machinery Company, Jacksonville, Fla.; E. F. Hartfelder, Hartfelder-Garbutt Company, Savannah, Ga. The

members for the manufacturers were as follows: M. W. Mix, chairman, Dodge Mfg. Company, Mishawaka, Ind.; I. R. Bailey, Diamond Rubber Company, Akron, Ohio; Chas. P. King, American Iron & Steel Mfg. Company, Atlanta, Ga.; E. A. Ludden, Detroit Oak Belting Company, Detroit, Mich.; Chas. E. McFarlan, Wm. Powell Company, Cincinnati, Ohio.

The entertainments planned by the committee were decidedly successful. At the smoker given on Tuesday night by the Jacksonville Board of Trade Chairman Christopher had some interesting things to say about the recent growth of Jacksonville, and as an example of the Southern product a pretty and sweet voiced young woman from Kentucky was put forward to lead the assemblage in singing Southern songs. A luncheon was served and impromptu speeches were made by a number of the members. The ladies at the convention were taken on a trip to Atlantic Beach on Tuesday afternoon. On Wednesday afternoon the ladies went on an automobile trip touring Jacksonville, and were entertained by Mrs. Christopher at tea at her home. The banquet on Wednesday night was a purely social affair. The ladies attended and there were no set speeches. J. G. Christopher was the toastmaster and he called upon a number of the leading members of the two organizations for remarks. There were some mutual admiration speeches, but most of those who were called upon discussed the South, and what they said would make excellent advertising material for any city below Mason and Dixon's line.

On Thursday afternoon the official meeting was brought to an end with a boat trip down the St. John's River, on a vessel loaned by the Clyde Steamship Company, by a joint executive meeting at which the new officers of both associations were properly introduced and vociferously applauded. Luncheon was served on board and a military band helped make things pleasant.

Convention Notes.

The Broderick & Bascom Rope Company, St. Louis, Mo., had an interesting exhibit in one of the rooms at the Seminole Hotel, which was in charge of John J. Broderick. Those attending the convention were served with a "police summons" commanding them to "answer the plaintive in an action upon a claim of friendship and good will, and to receive a souvenir." The souvenirs were very neat watch fobs. Samples of butt welded wire, with the weld tempered back to almost its original strength, were on exhibition, together with other of the company's wire rope products, including a carving knife made by one of the company's workmen from a piece of wire rope. Part of the rope, which consisted of Sheffield steel wire, was hammered down by the workman to form a blade, leaving one section untouched to make the handle. The blade was sharpened to such a keen edge that it might prove a dangerous weapon, and it bore excellent testimony as to the strength of the piece of wire rope from which it was formed.

Thomas Dickinson, Southern salesman for the New York Belting & Packing Company, was decidedly popular with certain attendants, as he distributed among the ladies a souvenir hatpin holder of glass decorated with silver deposit filagree work.

The Chas. Neidners' Sons Company, Malden, Mass., and E. C. Atkins & Co., Inc., Indianapolis, Ind., both gave away leather bill folders.

The F. B. Woods Company, Chambersburg, Pa., distributed paper cutters.

The A. Leschen Sons Rope Company, St. Louis, Mo., gave away souvenir pencils.

The Cleveland Rubber Works distributed smoking pipes incased in leather pouches.

The badges worn by the members made their identification easy; the dealers wore red badges, the manufacturers had blue badges and members of the press and other visitors were given white badges. Each

badge bore the name of the person wearing it and the firm he represented.

Miss K. L. Waterhouse, manager of the Kato Products Company, New York City, manufacturer of belt dressings, the only woman member of the Manufacturers' Association, was a familiar figure at the meetings, paying close attention to the discussions.

Two Extensive Iron Ore Deposits in Australia.

In an article entitled "Two Important Iron Ore Deposits of Australia," in the *Engineering and Mining Journal*, J. Bowie Wilson, Sydney, N. S. W., describes the Iron Island and Koolan Island iron mines. Iron Island is off the coast of Queensland, about 10 miles from the main land. The Mount Morgan Gold Mining Company has been taking out iron ore under an arrangement for the payment of a fixed royalty per ton and the construction of a jetty and bins from which steamers could load. In the past three years the company has shipped 90,000 tons of ore which has been used to flux silicious copper ores which this company treats at Mount Morgan. A rough surface sample taken from the whole iron ore area showed 64.72 per cent. iron, 2.51 per cent. silica, 2.95 per cent. alumina, 2.85 per cent. lime, 1.07 per cent. magnesia and 0.065 per cent. phosphorus.

Koolan Island is off the coast of West Australia. It is 8 miles long and 1 mile wide. Parallel to its greatest length is a series of ridges consisting of sandstones, quartzites and schists. The iron ore outcrops prominently on the south side of the island. It is anhydrous, retains a black metallic luster, but is not uniformly magnetic. In one case iron ore forms the south slope of a ridge from its summit 350 ft., to its base at water level. This lode outcrops more or less continuously for 1½ miles. In what the author refers to as the three western leases on the island the lode appears to vary from 4 to 50 ft. in width, while in places another smaller lode makes its appearance on the northern side of the ridge. On the north side of the island the outcrop is about 40 ft. wide, toward the east splitting into two beds which follow a nearly parallel course about 20 chains apart, one continuing for about a mile and the other farther. The southern lode averages 20 ft. in width, and "as its outcrop has been traced 3 miles with an average height of 250 ft. above sea level and dips at a flat angle, an enormous quantity of ore would be available above sea level." Analysis of a typical sample showed: Iron, 66.48 per cent.; silica, 4.16 per cent.; sulphur, 0.072 per cent.; phosphorus, 0.064 per cent.; moisture, 0.08 per cent., combined with water, 0.12 per cent.

Koolan Island is uninhabited. It has good shipping facilities as the ore outcrop runs parallel to Yampi Passage, an inlet off the Yampi Sound, with sufficient depth of water to carry steamers. The mainland opposite the island is uninhabited, except for a few wandering aborigines. Yampi Sound is about 100 miles north of Derby, which is on the northwest coast of Australia, on the direct route of boats going to Singapore or to the North Australia cattle ports. The possibility of developing an export trade in iron ore has been considered. Of the Australian states, New South Wales alone has a blast furnace. It is at Lithgow, about 100 miles from Sydney, and the ore supply is now taken from a deposit in the neighborhood.

The Valley Mould & Iron Company.—President George H. Boyd has issued an announcement that the name of the Thomas D. West Foundry Company, Sharpsville, Pa., has been changed to the Valley Mould & Iron Company, to better represent its operations since acquiring the Alice Furnace. Floyd K. Smith, formerly of Banning, Cooper & Co., Ltd., has become identified with the company as vice-president.

Gear Cutting on a Milling Machine.

A Novel Use of an Ordinary Horizontal Machine.

In the shops of the Newton Machine Tool Works, Inc., Philadelphia, Pa., an ordinary horizontal milling machine was recently put to a somewhat unusual use. The machine in question was fitted with a pair of index centers, and employed to cut steel spur gears. Fig. 1 shows the general arrangement adopted, while Fig. 2 shows one of the gears being cut.

The gears had a $3\frac{3}{4}$ -in. face, a diametral pitch of

they now know where considerable additional time can be saved on future operations. Previously when using one of the standard commercial makes of gear cutting machines, the time required was 128 minutes per gear, while by this way the time per gear was reduced to 35 minutes, which makes a total saving on the 12 gears of 18.6 hours. It also demonstrated that a large number of gears like this or similar work can be handled to much better advantage on a milling machine than they can on a gear cutting machine, as it would be practically impossible to maintain an average output on any gear cutting machine equal to that obtained here.

This is especially true when attention is called to the fact that the cutters were not resharpened at any time during the operation, which means that 1260 linear inches were milled without resharpening the cutter. Because only one set of cutters was available, and it was desired not to lose any time sharpening them, the rate of feed was kept down. It has since been found that these gears can be milled materially faster, but that the time required to remove and sharpen cutters more than offsets the time saved by the increased feed.

One of the big items in performing this operation was the advantage of being able to control all the motions of the machine without moving from one position, which

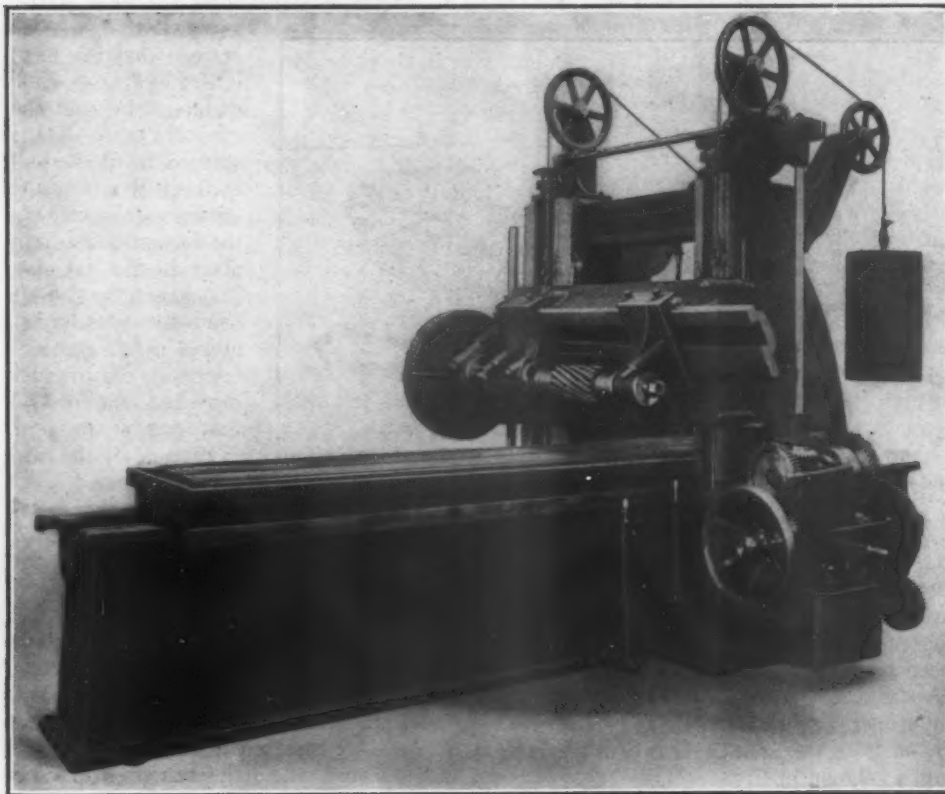


Fig. 1.—View of a Newton Horizontal Milling Machine, Built by the Newton Tool Works, Inc., Philadelphia, Pa., Equipped to Cut Spur Gears.

3, and 28 teeth. Twelve of these 0.40 per cent. carbon steel blanks were mounted on an arbor and cut at one time. Two cutters were used, one a roughing or stocking cutter of the stepped cone type, and the other a standard involute finishing cutter. Each movement of the table, therefore, roughed out and finished a tooth in each gear blank, and from the way they are held it is practically equivalent to cutting a 28-tooth pinion 45 in. wide, and having a diametral pitch of 3. The total time required for completing these 12 gears was seven hours, which is considered as ordinary time. As it was the first time the company had ever cut any gears by this means,

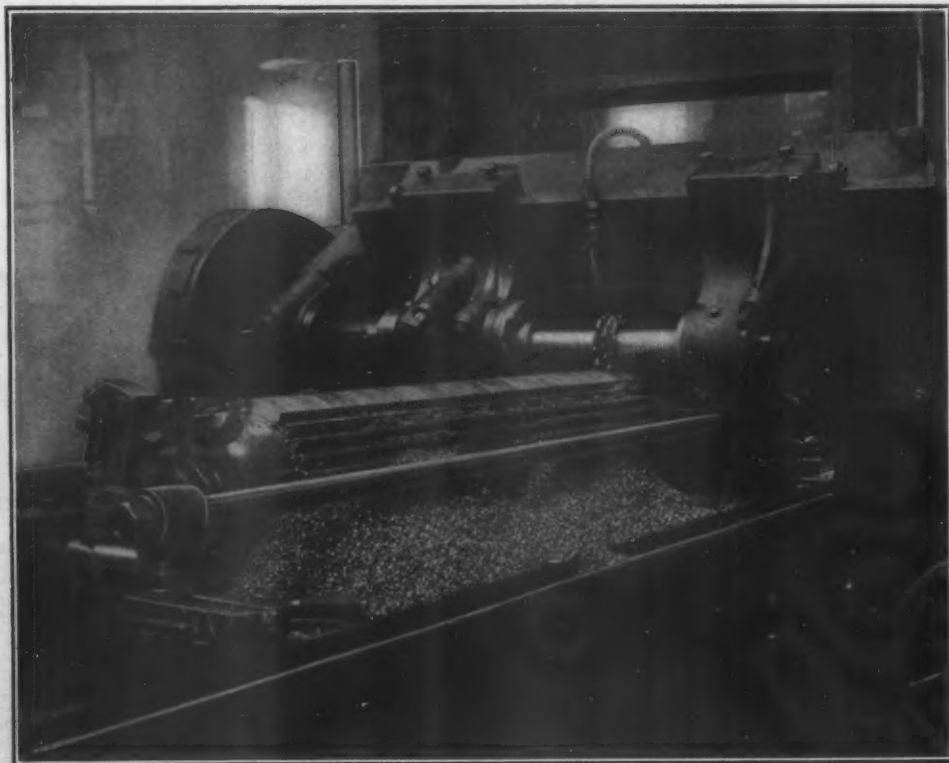


Fig. 2.—Cutting a Steel Spur Gear on a Newton Horizontal Milling Machine.

saves considerable time for the operator. The cutting time for these 12 gears was 7 hours, as opposed to 25.6 hours, and this only requires a feed of about 4 in. per minute to obtain these results. This is not at all excessive, as the company has frequently cut these gears at feeds of 10 to 12 in. per minute, but it has been found that grouping them in this manner produces the same result and saves the life of the cutter.

The machine used for this operation was of the regular Newton horizontal milling machine type, an illustrated description of one of which appeared in *The Iron Age* November 26, 1908. The spindle is driven by a phosphor bronze worm wheel and hardened steel

moved and replaced by the operator without resorting to the use of files, screw drivers, wrenches, the vise or the drill press. It is asserted by the maker that to remove or replace any part requires less than one minute and no tools whatsoever.

Not only can the head be taken apart, but it may also be assembled by hand without the use of any tools, and furthermore the parts themselves are of such a heavy construction that long life is assured. The construction is also very simple, and represents a marked departure from anything heretofore produced for the purpose.

Referring to Fig. 1, which shows the head partly

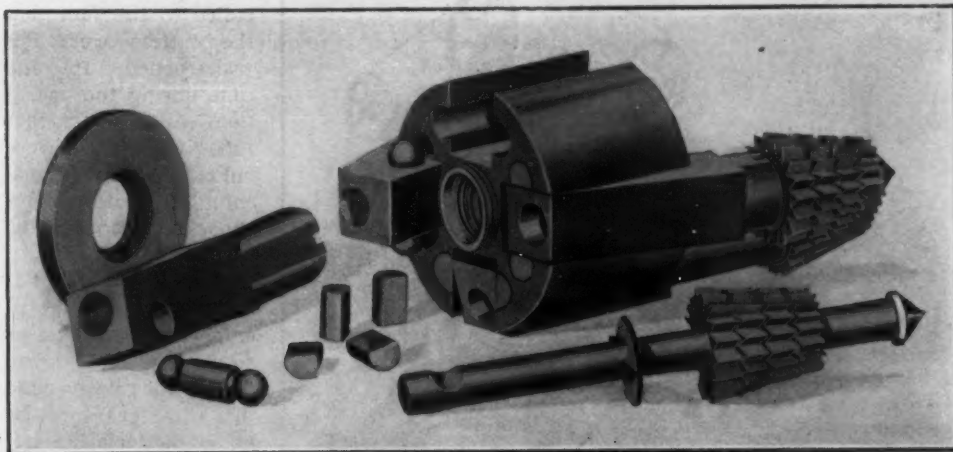


Fig. 1.—View of the Norivet Cleaner Head, Manufactured by the Liberty Mfg. Company, Pittsburgh, Pa., Showing Separate Parts.

worm with roller thrust bearings, which are encased and run in oil. The worm wheel is carried in a separate bearings, cast solid on the end of the cross rail and through this worm wheel the spindle is driven by a double spline. The spindle has a side adjustment for locating the cutters in the proper position, which is made by a rack and pinion on both the spindle bearing and the outboard bearing, as shown in Fig. 1. The cross rail is of the angular face design, is counter-weighted, and is provided with hand adjustment by the hand wheel shown, and a rapid traverse motion controlled by the lever just above the hand wheel. The table is surrounded by a pan for draining off the lubricant, and is operated by a spiral pinion and angular rack. Nine changes of gear feed and a rapid traverse motion in both directions are provided, all of which are controlled by levers shown in front of the machine. All the operating levers are so arranged that the operator does not have to move from his position at any time to completely control every motion of the machine.

The Norivet Cleaner Head.

In a number of types of cutter heads for boiler tube cleaners when a part breaks, it is necessary to stop the work immediately, take the head to a vise, where the rivet heads are cut with a hammer and cold chisel, or else to a drill press, where the rivet is drilled out. This all takes time, and where this cutting or drilling is done very often it is possible for more time to be consumed in making repairs than is used in actually freeing the boiler tubes from scale.

The accompanying engravings show the Norivet cleaner head manufactured by the Liberty Mfg. Company, 6910 Susquehanna street, Pittsburgh, Pa., which, it is stated, overcomes all the objections raised against the use of a freely swinging arm head for cleaning water tube boilers. Fig. 1 illustrates the head with the different parts removed, while Fig. 2 shows the head assembled and ready for use. As the name implies, no rivets are used in its construction, all parts being locked together in such a way that any part can be re-

assembled, it will be noticed that the head is slotted in the usual manner, and that the recess in these slots is formed to fit the ball ends of the trunnion shown separately in the foreground and in place in the left slot. In assembling the head, the cutter pin is placed inside the cutter, and the washer provided with lugs that engage in slots in the end of the arm is next slipped over the pin. The complete pin is inserted in the arm, and the

milled recess near the left end of the cutter pin registers with the trunnion pinhole in the arm. This trunnion engages the recess in the cutter pin, and holds it in place without the use of rivets, thus eliminating both the arm and cutter pin rivets formerly required. After the trunnion pin has been placed in the arm, the ends of the trunnion are inserted in the recessed slots provided for that purpose, and it is then pushed down to its seat, where it is firmly held in place by inserting two semicylindrical locking plugs in the slots. These plugs project a slight distance beyond the rear face of the slotted head, and when the large lock washer is screwed on the thread on the rear end of the head by hand, they serve to lock the trunnion securely in place.

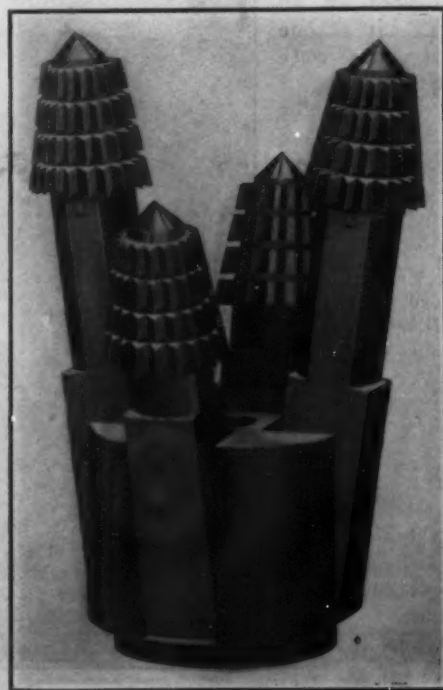


Fig. 2.—View of the Complete Head Ready for Use.

Nitrogen the Cause of Brittleness in Mild Steel.*

Too Much of the Responsibility for Failures Has Been Attributed to Phosphorus—Titanium as an Antidote.

BY C. E. STROMEYER, MANCHESTER, ENGLAND.

During the last few years I have been engaged on rather exhaustive experiments with mild steel plates, some of which had come out of exploded boilers, while others had failed in the workshop and yet others were of good quality. These experiments were undertaken to ascertain, if possible, whether any mechanical tests could be relied upon to discriminate between such plates as behave well both when tested and subsequently and such as behave well when tested but fail either in the workshop or when put to use in a boiler. The mere statement of this aim implies a suspicion that a structural or molecular change may take place in mild steel while, at rest, and my attention was naturally at first directed toward discovering whether any steels possessed ageing qualities. A test was devised which consisted in planing the edges of the test pieces, nicking them with a chisel, and then bending them, either at once or after waiting days, weeks or months, or after boiling the samples for a few minutes at a temperature of 212 degrees F., which boiling, so it was found, has the same effect as prolonged waiting. The change of ductility at the nick, where the material had been as much injured as when plates are calked, could easily be detected by measuring the curvatures near the nicks, the edges having been filed flat before bending.

Marked ageing effects were noticed in 24 out of 26 steels dealt with. One of the two exceptions (but this is a doubtful case) was a chrome vanadium steel, and the other sample was exceptionally rich in sulphur. Samples containing much phosphorus did not seem to be as much affected by ageing and boiling as the other samples, and no marked difference could be detected between steels which had failed in practice and others of presumably good quality. Temper and cold bending tests, percussion tests, alternate bending tests and fatigue tests did not help to detect those steels which had failed in practice, nor did the ordinary chemical analysis help to elucidate matters; and it was only when, after having heard of Mr. Braune's investigations into the effect of nitrogen on steel, this element was also determined, that light was thrown on the cause of most of the failures of plates which I had collected.

Details of Tested Steels.

The following is a list of the bad steels and a few others:

R.—British acid open hearth steel. Having passed the usual tensile, temper and bending tests, it broke while being bent between rollers.

S.—British acid open hearth steel. Having passed the usual tensile, temper and bending tests, it broke while being sheared into butt straps.

CC.—Probably British acid steel. No testing details obtainable. The marine boiler for which it was used burst under the hydraulic test.

M.—Burst butt strap of a large water pipe, believed to be basic Bessemer steel.

T.—Part of a fractured steel plate. Conditions of manufacture and testing unknown. About 25 years old. Possibly injured in working.

N.—British acid open hearth steel. Boiler shell plates cracked after being used for concentrating caustic soda for three years. The caustic is now known to have been the cause of this brittleness; it also affected other boilers by different makers, who used steels from different steel works.

P.—A thin piece of mild steel from America. Said to have formed part of an exploded boiler. The plate had no fractured edge, and the cause assigned for the explosion was

not very conclusive. Possibly this plate was not the one which actually caused the mishap.

Q.—Austrian basic open hearth steel. Having passed the usual tensile, temper and bending tests, this plate was used for a dome on a marine boiler and burst under the hydraulic test.

U.—German or Russian steel, probably basic open hearth quality. Having passed the usual tensile, temper and bending test, and having been used for a boiler shell, it burst, under the hydraulic tests after being in use for six years. The adjoining boiler burst under the same conditions one year later.

About 25 years ago, when I started the collection of bad boiler plates, two German steel works kindly supplied me with samples of good and bad steel plates, in order that I might make exhaustive comparisons.

J.—German basic open hearth steel of good quality.

K.—German basic open hearth steel from same works, containing about 50 per cent. more phosphorus than is considered safe. It had proved itself cold short. This plate was supplied in compliance with my request from a bad plate.

L.—German basic Bessemer steel from same works. This plate was also supplied at my request.

Details about the steel from other German works are as follows: (The bad qualities and rejections were included at my request.)

A, B and C.—German basic open hearth steel of various degrees of hardness but of good quality.

D.—German steel from the same works. It must have proved itself to be red short, for it contained a large percentage of sulphur.

E.—German steel from the same works. Rather rich in phosphorus and therefore expected to be cold short.

F.—German basic open hearth steel from same works; very rich in phosphorus.

G.—German acid open hearth steel from same works.

H.—German acid Bessemer steel from same works.

The remaining six steels of various degrees of hardness were received from British works; with the exception of Z, which is basic open hearth steel, the rest are acid open hearth steels.

High Nitrogen Content in Bad Steels.

The following list contains those of the above steels which actually failed or which were so bad as not to be sent to the boiler works and also a few good steels for comparison. Samples G and Z are basic open hearth steels, respectively of German and British make, and B and B B are acid open hearth steels, also of German and British makes respectively. The table contains the leading chemical impurities, and in the last column will be found the sums of the percentages of phosphorus added to five times the percentages of nitrogen. This ratio in the relative brittleness influences has been adopted, partly because it is the inverse ratio of the squares of the respective atomic weights of the two elements and partly because nitrogen has a ten-fold greater effect than phosphorus in raising the tenacity of steel, an addition of 0.01 per cent. increasing the

Steel qualities.	Plate marks.	Carbon per cent.	Nitrogen per cent.	Phosphorus per cent.	5 nitrogen + phosphorus
	Q	0.127	0.0200	0.052	0.152
	L	0.090	0.0153	0.060	0.136
	H	0.210	0.0145	0.070	0.151
	C C	0.130	0.0123	0.047	0.108
	M	0.090	0.0090	0.052	0.097
Bad qualities of steel.	U	0.110	0.0066	0.052	0.085
	F	0.097	0.0043	0.210	0.231
	R	0.185	0.0030	0.177	0.192
	K	0.205	0.0041	0.095	0.115
	E	0.165	0.0029	0.076	0.090
	S	0.135	0.0038	0.065	0.084
Uncertain	T	0.200	0.0023	0.038	0.040
Basic O. H. steels	G	0.215	0.0050	0.051	0.076
	Z	0.195	0.0033	0.039	0.055
Acid O. H. steels	R	0.200	0.0040	0.032	0.052
	B B	0.200	0.0052	0.029	0.045

* A paper read at the spring meeting of the fifty-first session of the Institution of Naval Architects, London, England., March 18, 1910. Mr. Stromeier has contributed several papers to the Iron and Steel Institute on the "Ageing of Mild Steel," in which were given the results of experiments on the influence of nitrogen.

tenacity by about 3 tons. It has been assumed that the relative brittleness effects of the two elements may be even greater than 10 to 1, but are at least as 5 to 1, which is the adopted ratio.

Phosphorus a scapegoat.

Until quite recently nothing was known about the brittleness effect of nitrogen on steel; as regards phosphorus, 0.060 per cent. was looked upon as a reasonable upper limit, and steel plates containing more than this percentage were expected to give trouble in the works due to cold shortness. This view has now to be modified; at any rate, sample C C, which was undoubtedly a very bad quality, possibly produced by the same process as the notorious boiler plates of the Imperial Russian yacht *Livadia*, contains only 0.047 per cent. phosphorus, but it also contains 0.0123 per cent. nitrogen, which is more than twice as much as that contained in any of the good steels. Then again Q, which was cut from a boiler plate which also burst under the hydraulic test, contained only 0.052 per cent. of phosphorus but 0.0200 per cent. of nitrogen, which is four times as much as that contained in any good steels. A safer rule to go by than the above is based on the values contained in the last column of the table and may at present be expressed as follows:

The sum of the percentage of phosphorus plus five times the percentage of nitrogen should not exceed 0.080 per cent.

And a further conclusion to be drawn from this investigation is that:

No investigation into the cause of the failure of a mild steel plate can be considered complete unless both the phosphorus and nitrogen percentages have been determined.

The nitrogen determination is extremely simple and rapid, but every possible precaution has to be adopted to guard against contamination by ammonia either in the re-agents or in the atmosphere.

Nitrogen Determinations for Steel That Failed.

Having arrived at the above conclusions, the plan now adopted by the Manchester Steam Users' Association is to determine the nitrogen of any samples of steel which have failed.

Some Continental angle irons intended to be used in some small portable locomotive boilers failed in the boiler shop. Nitrogen, 0.0146 per cent.

On cutting out portions of a damaged furnace plate, it proved to be quite brittle. Nitrogen, 0.0180 per cent.

Fractured steel plates from a ship building in a Continental port, which plates had been duly tested and passed for shipbuilding, and which give good results when retested. Nitrogen, 0.023 per cent.

These percentages are from three to five times as great as the maximum found in any of the good steels yet tested.

A very natural question to ask is, When does the nitrogen get into steel, and how can it be removed when it has got there? The most natural explanation would be that nitrogen is introduced by the contact of molten steel with the nitrogen of the air blasts in the blast furnaces and in the Bessemer converters. This is partly confirmed by the following comparison of Bessemer steels of the above lists with other steels and wrought irons:

Percentages of nitrogen in Bessemer steels: (L) 0.0153, (H) 0.0145, (60) 0.0108, (20) 0.0160, (40) 0.0150. Percentages of nitrogen in open hearth acid and basic steels of previously mentioned samples, 0.0024 to 0.0050 per cent. Other mild steels: (25) 0.0042; steel forging, 0.0022; bad wrought iron with 0.219 per cent. phosphorus, 0.0084 per cent. nitrogen; charcoal iron, 0.0035.

Titanium the Preventive.

In spite of this confirmation of a very natural view on the subject, it has to be borne in mind that as yet it has not been possible to combine nitrogen with steel

by merely heating the two together, and that the only means of effecting the combination is to heat steel in an atmosphere of ammonia. Now ammonia is not introduced into Bessemer converters, but it may be present in blast furnaces if the coking of the fuel has not entirely removed the nitrogen which was in the coal. Then, also, it seems as if nitrogen, when once it has entered the pig iron in the blast furnace, cannot be removed by subsequent heating. The suitable chemical for effecting the removal is believed to be titanium, but the addition of ferrotitanium alloy to steel has not demonstrated that this beneficial action takes place. This is probably due to the necessary temperature conditions being as yet unknown, but nevertheless a strong argument in favor of the belief that titanium can remove or keep down the percentage of nitrogen was recently brought to my notice by the discovery inside the now dismantled blast furnaces of the Farnley Iron Company of some crystals of titanium nitride, which are now to be seen in the Leeds Museum. To my mind, unsuspected traces of titanium in the Farnley iron ores may have been the reason why the product always enjoyed a high reputation for reliability.

Under these circumstances it seemed desirable to ascertain more definitely how titanium acts in practice, but it was only with great difficulty that the necessary samples could be obtained. It appears that attempts to introduce titanium by adding its ores in the blast furnace have not been a success, nor have additions of titanium ores or titanium iron alloys to molten steel or cast iron resulted in marked improvements, and in none of these cases has the nitrogen percentage been determined. Of late, however, since the production of practically pure titanium has been effected, its addition to steel and cast iron has been attended with varying degrees of success, more particularly in removing blow holes, and I have been able to analyze one pair of cast steel samples and a pair of cast iron samples. Unfortunately, the original charge of cast iron contained very little nitrogen, viz., 0.0014 per cent., but even in this case the addition of 0.2 per cent. of titanium reduced the nitrogen to 0.0013 per cent., but the slight difference is smaller than the possible errors of analysis. Of the two cast steels the untreated one contained 0.0063 per cent., which was reduced in the other sample to which titanium had been added to only 0.0045 per cent. Further attempts in this direction may perhaps lead to the removal of nitrogen from Bessemer steel and thus make it available for plates.

It may be thought that the brittlenesses, which have here been attributed to nitrogen, are due to hydrogen, for it is known that this gas imparts extraordinary hardness to otherwise pure iron, but it is also known that hydrogen is easily driven out by heating the steel, and it is, therefore, improbable that appreciable quantities of hydrogen should remain after melting and reheating for rolling.

Duff Jacks Win an African Contract.—The Duff Mfg. Company, Pittsburgh, has taken an important foreign contract under circumstances which are highly gratifying. The Central South African Railway Company some time ago entered the market for jacks to be used over its entire system. The amount involved being quite heavy, the world's largest jack manufacturers started a hot campaign for the contract, involving Germany, England and the United States. Representatives from jack manufacturers in these countries actively besieged the company's headquarters in Germiston, the metropolis of the Vaal River Colony. The culmination of the international industrial war was the letting of the contract to the Duff Mfg. Company, sole maker of the genuine Barrett jacks and the Duff-Bethlehem hydraulic jacks. The company won the business despite the fact that its jacks were higher in price.

The Atlas Coke Quenching Car.

A Device Which Has Superseded the Older Forms of Quencher.

Manufacturing coke in large quantities calls for apparatus that will handle it easily and economically, and also a car that will not waste the breeze, which is the fine particles produced in quenching. The car built by the Atlas Car & Mfg. Company, Cleveland, Ohio.

gives an even distribution of the volume of hot material back while it is hot and soft produces a coke of large dimensions; and, thirdly, the rapidity with which the water cools the coke gives little chance for the air to cause the product to disintegrate, and thus produces the minimum amount of breeze.

In operation the car is placed in front of the battery of ovens and is moved back and forth under its own power or by a locomotive to such ovens as are ready to be discharged. The pusher expels the hot coke upon the platform of the car, whose movement

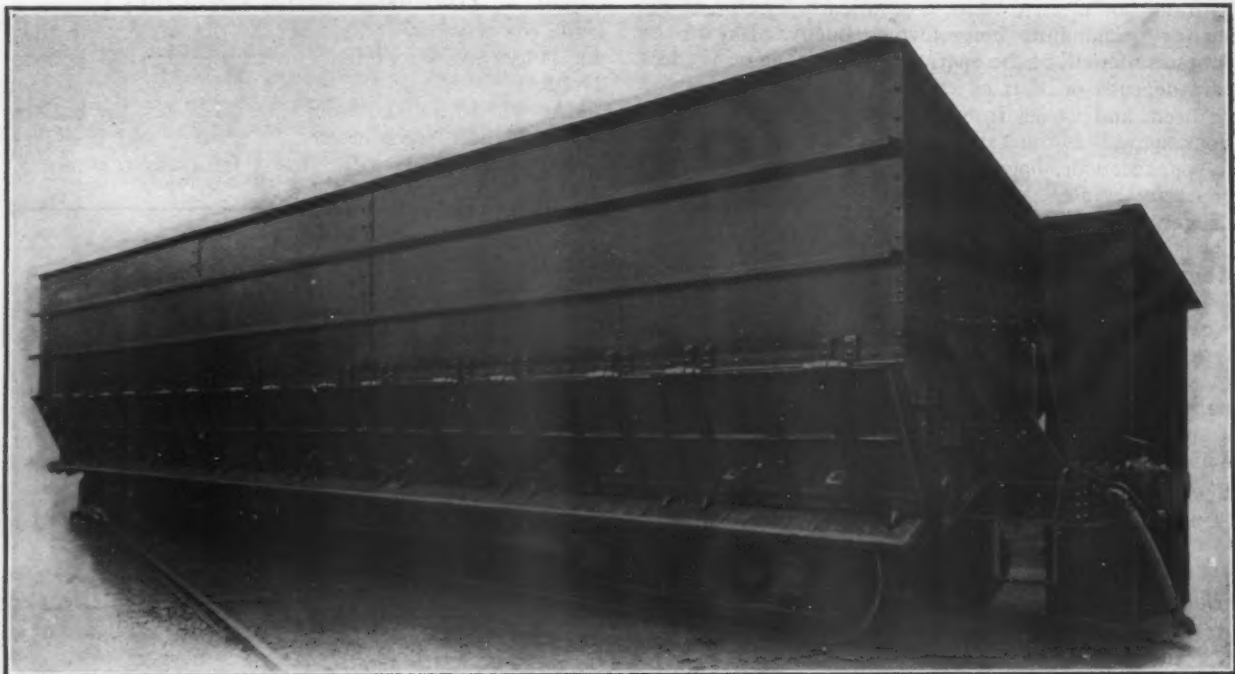


Fig. 1.—Front View.

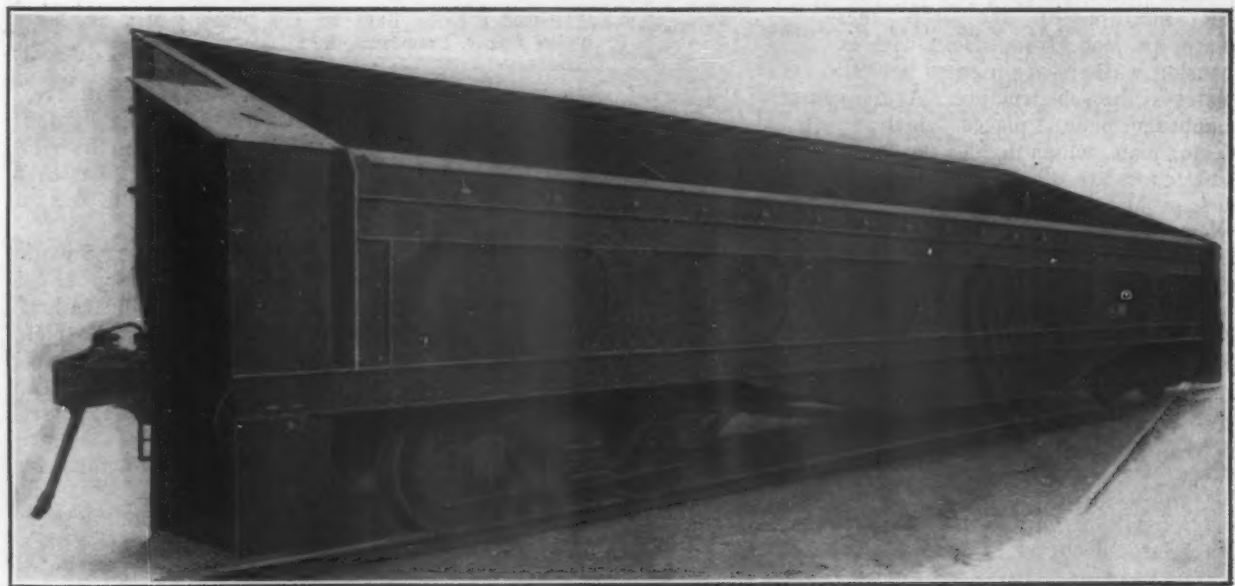


Fig. 2.—Rear View.

The New Coke Quenching Car, Built by the Atlas Car & Mfg. Company, Cleveland, Ohio.

and shown in the accompanying illustrations, it is said, takes care of these important functions, and is used by some of the largest by-product coke plants in this country. The main object is to quench the coke quickly and transfer it either to the storage bins or the distributing house. Fig. 1 is a front view of the car and Fig. 2 shows the rear.

One great advantage of the quenching car over the old basket quencher or inclined hearth methods is the small percentage of breeze produced. First, on account of the location of the platform of the car in relation to height of hearth, the body of hot coal travels a mini-

gives an even distribution of the volume of hot material. Water is then turned on either through nozzles adjacent to the ovens, or else the car is brought under the quenching hood, which is conveniently placed over the tracks, and not far from the ovens. The hood is generally considered the most up-to-date method of quenching, as it concentrates the vapor and the breeze, and also the water is placed in the required position, giving a more equal distribution and putting it where it is most desired.

To hold the breeze in the car, instead of allowing it to be washed into the sewer, a special door is ar-

ranged so as to hold the breeze, with the rest of the coke, in the car. With the old method, this breeze is washed in the gutters, this being a continual source of annoyance and waste. Another great advantage of these cars, particularly for the up-to-date by-product coke plant, and especially those operated in connection with steel works, is that the coke can be immediately utilized from the ovens, or placed where it is needed without additional handling.

These cars are built in several designs, both motor and non-motor driven, and have gravity opened doors or doors opened by air, the air for the latter type being furnished by an electric air compressor mounted on the car. In large plants the doors are also opened by hydraulic or electric rams, conveniently located at the sorting or handling house, which open and close the doors at the will of the operator. The capacity of these cars depends on that of the ovens where they are to be used, and varies from 8 to 13 tons. The illustrations show a 10-ton car, having a hand-operated gravity opened door, operated by two 40-hp. motors, with contactor system of control. The master controller is conveniently placed in the cab at either end of car, where the brakes and other apparatus are located.

This car is being built in several types to suit the different conditions of ovens, locations and methods of handling, but the following general description will suffice for all: The main body or framework of the car is composed of structural material properly designed to take care of the overhanging load. The bottom plates are of special construction and are lapped over each other toward the discharging end of the bottom and are practically water tight. Owing to the rapidity to which these bottom plates are subject to expansion and contraction, special care is taken with the mixture of the iron these plates are made from. Bolts with expansion washers are used to hold the plates to the sub-structure. At the center of the car a diaphragm plate is placed, which is fastened to the deflector plate, which divides the load and forms a brace. The trucks are of special design, fitted with water and dust proof boxes, and equipped with a special asbestos wound electric motor, which will withstand the high temperatures. All the wiring is rubber covered and is run in metal conduits.

These cars have been used by the Milwaukee Coke & Gas Company, Milwaukee, Wis., for several years at its large plant, where the famous Solvay coke is made, and will be used at the new Koppers ovens now being built at Gary, Ind., where 3000 tons of coke and 40,000,000 cu. ft. of gas will be produced every 24 hours, this, it is stated, being the largest by-product coke plant in the world. The Lake Superior Iron Corporation at the Soo will use 10 of these cars in connection with another large Koppers by-product oven, where the cars will be used for transferring the coke directly from the ovens to the blast furnace, thereby saving any re-handling.

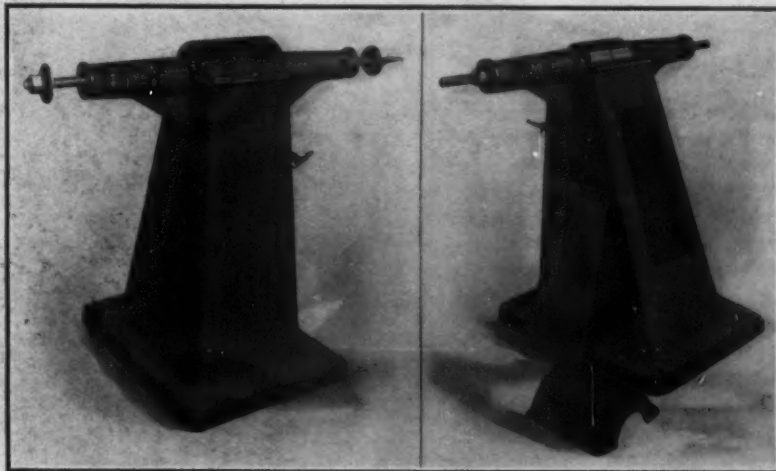
Cast Iron Specifications.—A call has been issued by Walter Wood, chairman, and Dr. Richard Moldenke, secretary, for a meeting of Committee B, on Cast Iron, of the American Society for Testing Materials at the Engineers' Club, 1317 Spruce street, Philadelphia, at 12 m., Saturday, April 16. The chairman will report on progress made in the past year in the international specifications, particularly as to the grading of pig iron, and will give an account of what took place relative to the work of the committee at the Copenhagen congress in September, 1909. It is expected that consideration

will be given at the meeting to desired changes in the specifications worked out by the committee which have now become the standard of the American Society for Testing Materials.

A New Diamond Polisher.

In response to a great and increasing demand for a polishing machine that can be driven by a belt from the floor below, the Diamond Machine Company, Providence, R. I., has developed the new style of polishing lathe shown in the accompanying illustration. In this machine all necessity for an overhead countershaft and unnecessary belting is done away with, and because of the entirely inclosed form of the column a rigid construction is obtained at the same time that all danger of interference with the driving belt is avoided.

As will be noticed from the two views, the pulleys on the spindle are protected by a cover which is fastened to the column with bolts. If for any reason it is



Front View, Pulleys Covered.

Rear View, Cover Removed and Interior Open.

Two Views of a New Polishing Lathe Built by the Diamond Machine Company, Providence, R. I.

found desirable to drive the machine from an overhead countershaft at any time, this can be easily done by removing the cover from the pulley. In the view at the right the removable cover at the back has been taken off for the purpose of inspecting the belt or making repairs.

The machine is adapted to a wide range of work, as the spindle extends for some distance on either side of the column. As indicated by the illustrations, the bearings are long and are provided with rigid supports. In the illustration at the left a removable taper point that is provided for attachment to one end of the spindle is shown. A convenient means for starting and stopping the machine is supplied by the small handle projecting from the front of the column near the right edge.

The height of the spindle above the floor is 38 in. and the amount of floor space required is only $33\frac{1}{2} \times 54$ in. Polishing wheels up to and including 16 in. in diameter can easily be swung from the spindle ends.

Setting Large Milling Machines.—The larger sizes of the new types of milling machines are of such proportions that the operating parts and the work itself are brought higher from the floor than in the usual run of machine tools. In the shops of the Potter & Johnston Company, Pawtucket, R. I., correction has been made to add to the operators' convenience by setting the base into the foundation, all machines being on the ground floor. The base is placed upon its foundation several inches below the floor, is leveled up, and the space about it is filled with concrete. The system lends an added rigidity to the installation.

A New French Gear Cutter.

There has recently been built by the Société Française de Machines Outils, Paris, France, a new model of gear cutter for cutting the teeth of spur gears. The Carpenter-Kerlin Gear Company, 77 White street, New York City, is the American agent for the machine, and it has been placed on exhibition there. As will be noticed from the accompanying illustration, the machine is compact and there are but few exposed parts.

The blank upon which the gear is to be cut is mounted on a horizontal spindle, and an indicator is fastened in place behind the cutter. This has a line cut on its upper face at the center, and this mark is made to coincide with a mark on one of the cutter teeth. After this is done the outer edge of the blank is brought almost into contact with the cutter, which is then run past the blank until a complete revolution of the latter has been made to determine the correctness of the divisions obtained from the dividing wheel and gears.

The table is provided with three adjustments. The longitudinal movement which regulates the depth of the tooth is controlled by the large hand wheel at the end, which can be turned so as to move the table and vary the depth of cut by 0.001 in. The cross feed which governs the length of the tooth and the swivel motion for varying the angle of the bevel are controlled in the customary manner.

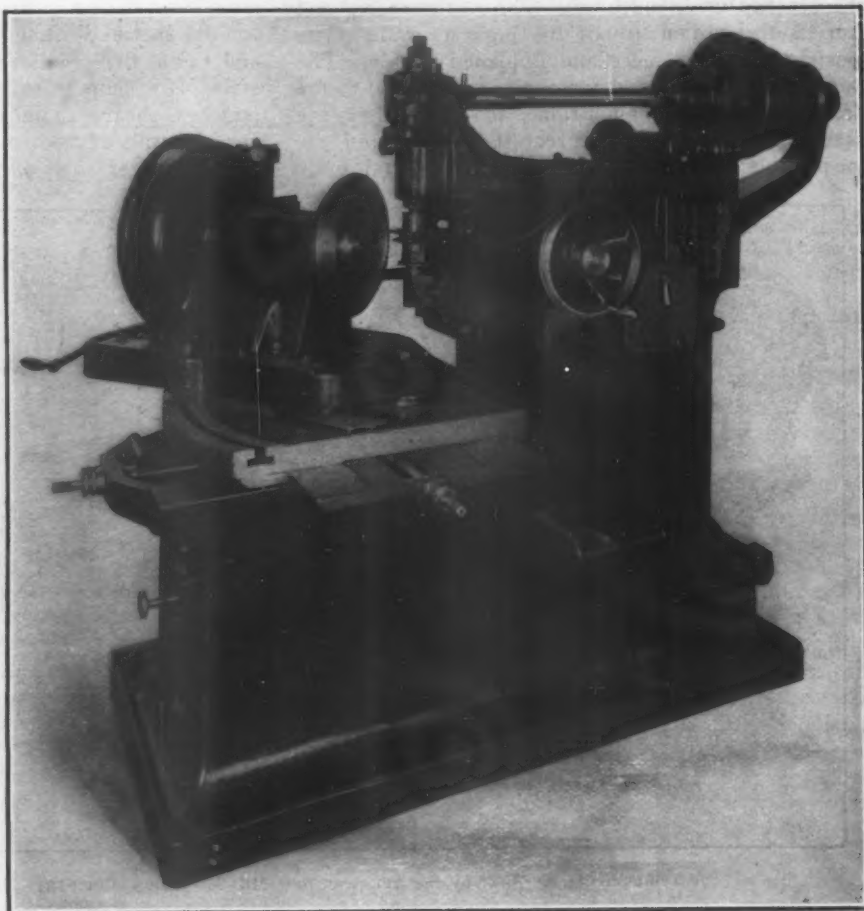
Seven changes of feed are provided, varying from $1\frac{1}{4}$ to 3 in. per revolution of the gear blank. The feed gears are simply placed on the studs in the feed box, and are held in their proper places by the closing of the cover. In this way no tightening of the gears is required, and they are easily and quickly removed whenever it becomes necessary to change the rate of feed. The dividing gears, which regulate the number of teeth to be cut, are mounted on the back of the machine, and are so arranged as to provide for easy removal when changes in the pitch are to be made.

In operation the cutter, which is the same in its general appearance as an ordinary milling cutter, except that the teeth are arranged to form a helix, and the blank upon which the cutter is operating, are rotated in unison. The speeds of the cutter are four in number and range from 40 to 160 rev. per min., with two intermediate steps at 65 and 105 rev. per min. The power for operating the spindle is transmitted from the countershaft to the cone pulley, shown at the right, and from there to the cutter spindle through a knuckle joint and gears, the ratio being 7 to 1. The large dividing wheel, which is mounted on the spindle with the blank, is 15 in. in diameter, and is driven by a shaft at the back of the machine that may be seen in the space between the blank and the body of the machine. This shaft is driven through bevel gearing from the feed box. In cutting the teeth the cutter travels across the machine, and its motion is controlled by the hand wheel alongside of it.

The maximum diameter of wheel that can be han-

dled is 16 in. and the greatest length of tooth is $3\frac{1}{4}$ in. The diametral pitches are $3\frac{1}{2}$ for steel blanks and 3 for iron blanks, respectively. The countershaft should be run at a speed of 650 rev. per min. and the pulleys are 13 in. in diameter, with a 3-in. face. Approximately 2 hp. are required to operate the machine, and its net weight is 4200 lb. In a recent test of the cutter, a steel gear of 60 teeth having a face $1\frac{1}{2}$ in. long and a diametral pitch of 3 was cut in 40 min. to within 0.0197 in. of the finished dimensions of the flank and roughed to the exact depth.

The chips resulting from the cutting of the teeth are removed from the table by gravity and pass down through a passageway beneath and behind the cutter to a pan in the base. The lubricant passes down into a reservoir in the base of the machine, and is pumped



General View of a New French Gear Cutter, Built by the Société Française de Machines Outils, Paris, France. Carpenter-Kerlin Gear Company, New York City, American Agent.

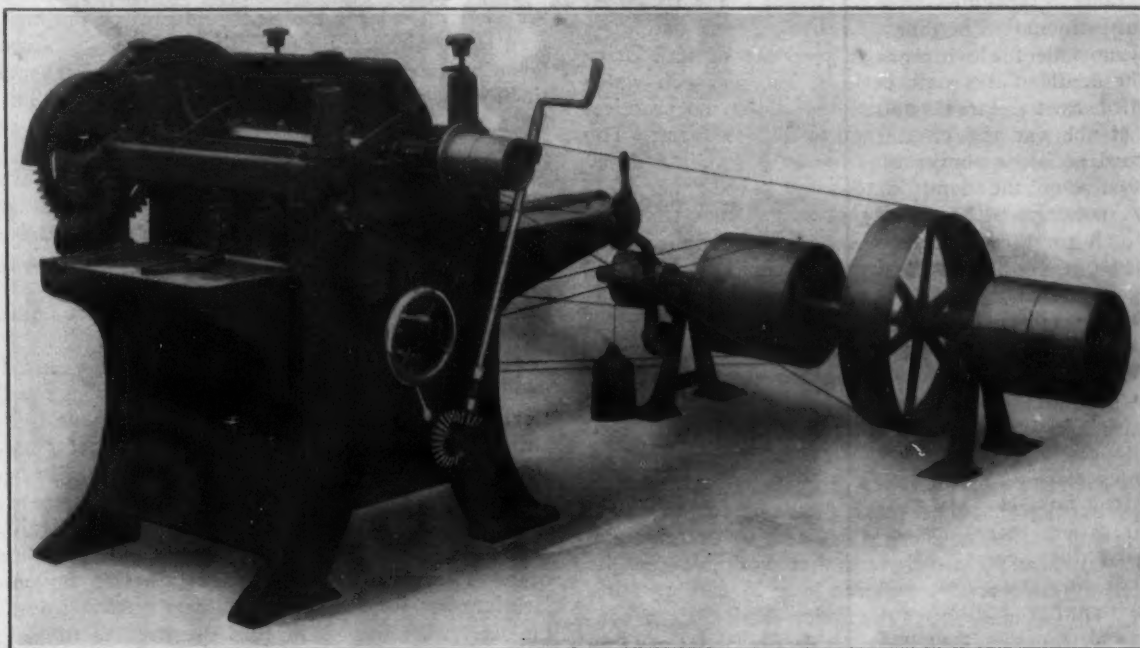
from there to a tank in the upper part by a pump driven by the two small pulleys at the right end of the machine. From this tank it is again fed to the cutter through the small tube shown.

A Long Service Record for Belts.—One of the mill rooms in the plant of the Joseph Dixon Crucible Company, Jersey City, N. J., is equipped with 30 6-in. belts, each about 25 ft. long. Although there is a considerable amount of graphite dust in the atmosphere of the room these belts have run satisfactorily without breakage or without being taken up for 18 years. No special care has been given to them except regular treatments of the company's traction belt dressing. This is in the form of a paste and it is said to be a quick and sure cure for slipping belts without having any detrimental effect upon the leather. For use where a quick and convenient dressing is desired a solid belt dressing is suggested by the manufacturer, who states, however, that the paste dressing is the better of the two, as some of the ingredients in it cannot be reduced to solid form.

The New Triumph Planer.

A new combination woodworking machine, known as the American Triumph planer, matcher and molder, has just been placed on the market by the American Saw Mill Machinery Company, Hackettstown, N. J. The manufacturer's idea was to build a machine that would meet the requirements of the smaller saw mills and one that could be sold at a reasonable price.

The machine is very compact and rigid, as can be seen from the engraving, and is designed to economize space as well as withstand hard usage. The entire absence of vibration, so common in small planers of this type, is claimed, and the work turned out is said to be uniform and equal in quality to that of the larger and more expensive machines. The workmanship and materials throughout are of the highest grade. The table is cast in one piece and is planed on top. The slides are long and placed far apart, being fitted to the outer edges of the main frame, to which they are gibbed, thus securing the greatest rigidity and the least possible wear. The cylinder is of a special grade



The Triumph Planer, Built by the American Saw Mill Machinery Company, Hackettstown, N. J.

of steel and is milled on four sides, two of which are slotted to carry the beading and molding knives in addition to the regular planer knives, which do not have to be removed when either of these other operations are being performed. The matcher spindles are exceptionally large and run in long babbitted boxes provided with ample means of lubrication. The frames are carried by guides of 1 1/2-16-in. round steel and are provided with means for taking up wear or lost motion. One of the spindles is adjustable by a hand wheel at the side of the machine and has an eccentric clamp for holding it in any desired position. The matcher heads are of standard design and will carry matcher, edger or molding bits 5-16 in. thick and not over 2 1/2 in. wide. Where the cut is not deeper than 3/8 in. molding knives can be used on the main cylinder. A heavy adjustable chip breaker is placed in front of the cylinder, which serves as a hood.

The membership of the American Foundrymen's Association is now voting on the proposal to increase the annual dues from \$5 to \$10. There has been a sentiment in the organization in favor of such an increase, that funds might be provided to carry on investigations of foundry materials and processes. The ballots will be canvassed by the Executive Board of the association and the result will be reported at the Detroit convention, June 6-10.

The West Pulverizing Machine Company's New Plant.

The West Pulverizing Machine Company, Asheville, N. C., is now erecting on property recently purchased, comprising about 4 acres, located on the Southern Railway and French Broad River, what will be the largest manufacturing establishment in that section of the country. The plant will comprise a number of buildings, designed specially to house the machine shop, pattern shop, foundry, blacksmith shop and steel plate shop. The buildings will be equipped throughout with traveling cranes, and other modern improvements will be installed to facilitate the building of the company's large sized pulverizers. The machine shops are to be fitted with boring mills of 10 to 12 ft. swing, required for the special work in this line. The planers, lathes and radial drills will be of corresponding sizes. The steel plate shop is to have, in addition to the usual punches, shears, radial drills, &c., a set of extra large bending rolls of 25-ft. width between housings, so that the pulverizer shell plates of 25 ft. in length, in one

length of plate, can be made without any circular seam. As these are unusually long rolls, they are being made specially for the company's work.

Liens on Vessels for Repairs and Supplies.—The various branches of the National Metal Trades Association, located in maritime States, have been urging the passage of House Bill No. 15,812, reported favorably by the Judiciary Committee of the House of Representatives at Washington. It relates to liens on vessels for repairs and supplies. Under admiralty law as now administered, a lien is implied for necessities furnished a vessel in "foreign" ports or States. In this connection the various States of the Union are regarded as "foreign" to each other. In the "home" State of a vessel a lien is not implied unless provided for by State laws. The confusion arising from diverse statutes and constructions has led to the preparation of the bill in question.

The blast furnace of the Standard Iron Company, Goodrich, Tenn., has been doing excellent work in recent months. In February a new record was made, but this was exceeded in March when the output was 2545 tons, or an average of 82 tons a day, all grading No. 2 foundry or better. On the record day of the month an output of 97 tons was made. The furnace is 12 x 55 ft.

THE BRIEY IRON ORE DEPOSITS IN FRANCE.

Part of the Most Remarkable Iron Ore Region in the World.

BY OUR OWN CORRESPONDENT.

In the development of iron ore supplies on the Continent of Europe the most remarkable fact within the past half-dozen years has been the rapid increase in production in the Briey basin, which lies just across the French-German frontier to the northwest of Metz. About 10 miles north of that city the river Orne falls into the Moselle from the west, and a few miles west of the frontier the small river Mance empties into the Orne, coming from the northwest. On the Mance, several miles above its mouth, is situated the small town of Briey, which gives its name to this valley, a name which also includes the upper Orne valley in most of the reports on the subject.

The Early History of the Deposits.

It has been known for a considerable time that iron ore deposits exist in this district, but the working of them to any extent is of comparatively recent date. As early as 1881 the existence of good ore around Briey was established through borings, but so much water was found at the levels containing it that no practical importance was at first attached to the discovery. The first concession to mine ores in the immediate Briey valley was not taken out till 1892, but in the upper Orne valley mining had been going on as early as 1882 and 1886. After the basic process had been applied with great success to iron made from the similar ores found in German Lorraine and Luxemburg, increasing importance was attached to the discoveries on the French side of the line and borings were rapidly made throughout the strip of country skirting the German frontier from a point to the west of Metz as far to the northwest as Longwy, near the frontier of Luxemburg and Belgium.

By the year 1897 the Briey deposits had attracted so much attention that the French Academy commissioned the mining engineer, Georges Rolland, to examine and report on them. He estimated that workable deposits existed over a territory 25 miles long by 4 to 15 miles wide. He calculated that the Briey section alone contained 87 square miles of workable ore and the Orne valley, further south, 62 square miles. He placed the average thickness of the deposits at 50 ft. along the frontier, thinning down toward the south and west away from the frontier. The richness of the ores was given by him at from 32 to 40 per cent. iron, but some of the mines now in operation around Briey are working on ore running 42 to 43 per cent., whereas the average iron contents of the Luxemburg-Lorraine ores will probably not run above 30 to 33 per cent. on an average. Rolland found the ore-bearing strata to be six in number, one above the other, the most valuable of which varies in thickness from 6½ to 13 ft. and running from 30 to 40 per cent. and even richer in iron.

The Most Remarkable Iron Ore Region in the World.

This ore district in France constitutes the continuation of the deposits in German Lorraine and Luxemburg; and the whole region, French, German and Luxemburgian, is pronounced the most remarkable iron ore region in the world. According to the most recent estimates it covers about 328 square miles, of which about 150 falls to German Lorraine, the same to France and the rest to Luxemburg. The amount of ore in this vast region is simply prodigious; it has hardly been scratched, despite the great development on the German side of the line in the past 25 years. In a paper read before the annual meeting of the Verein Deutscher Eisenhüttenleute, in May, 1909, it was estimated that the Lorraine-Luxemburg deposits still contain 2,700,000,000 tons of ore. According to another estimate,

French Lorraine contains 1,300,000,000 tons of ore, but this is probably much too low. According to estimates published by the *Chemiker Zeitung*, nearly four years ago, France had an aggregate of 31,150,000,000 tons of iron ores in its soil, of which 30,000,000,000 tons are in the Lorraine region.

Mining in the Briey basin is at a maximum depth of about 900 to 1000 ft., where shafts are sunk from the plateau, but the ore outcrops in some of the deeper valleys, where it can be mined by driving adits from the outcrop. Mining concessions have been taken up very rapidly during the past 10 years. Not a few of the biggest German iron companies, some of which already own ore lands in Lorraine, have acquired large properties around Briey, in order to take advantage of the richer ores found there, which will be smelted on the German side of the line. Several of the big German companies are now erecting, or are about to erect, large furnaces and steel mills close to the French frontier to work up these ores. The great firm of Thyssen & Co., for example, has acquired over 4300 acres of ore land near Briey, and is preparing its plans to build great iron works in Lorraine. The great Gelsenkirchen Company of Dortmund is carrying out similar plans. It is probably no exaggeration to state that at least a dozen German companies have bought or leased ore properties in this ore region.

To make these ores available for import and shipment into the Rhenish-Westphalian iron district, the government railroads a year or two ago reduced the through rate of freight on French ores from the frontier into that district to the same figures as those of Luxemburg and Lorraine, and since that time the French ores have been shipped in ever-increasing quantities to the great furnaces on the lower Rhine and Westphalia. On the French side, too, the railroads are doing their part to facilitate the exportation of ores. The railroad running through this region into Belgium has for several years been making a low rate on ores, with the result that the exports to Belgium are rapidly increasing. French ores from Briey are fast displacing German and Luxemburg ores at the Belgian furnaces, and the mine owners in Lorraine and Luxemburg fear that they will lose their export trade with Belgium completely.

France's Foreign Trade in Iron Ores Revolutionized.

The rapid development of production in the Briey region has completely revolutionized France's foreign trade in iron ores within the past 8 years. In 1902 France imported 1,583,000 metric tons of ore and exported only 422,600 tons, but by 1909 exports had jumped to 3,907,300 tons and imports had dropped to 1,202,600 tons. The export from eastern France into Germany increased from 455,700 tons in 1906 to 1,173,500 tons in 1909. Germany and Luxemburg exported 1,631,000 tons of ores to France in 1905, but by last year these exports dropped to 863,000 tons.

The growth of ore production in the Briey basin is shown by the following table:

Years.	Tons.	Years.	Tons.
1899.....	102,131	1907.....	4,110,755
1901.....	345,654	1908.....	4,580,223
1903.....	1,204,706	1909, over.....	6,000,000
1905.....	2,352,848		

It is a noteworthy fact that production on the French side has already reached about half of that of German Lorraine. It may be mentioned here that, according to French reports, new mines now coming into operation around Briey are expected to bring up the production to 13,000,000 or 15,000,000 tons by the year

1914. The vitality of the Briey district is indicated by the fact, shown in the above table, that its production continued to increase in the bad business year of 1908, whereas there was a considerable shrinkage of output in German Lorraine and in Luxemburg and less ore was also produced in the adjacent districts of Longwy and Nancy.

Iron manufacture in the Department of Meurthe-et-Moselle, in which the Briey basin is situated, has also developed rapidly. That department now produces about 70 per cent. of the pig iron made in France and 50 per cent. of the steel.

The Koerting Obnoxious Vapor Condenser.

A recent type of obnoxious vapor condenser built by Schutte & Koerting Company, Philadelphia, Pa.,

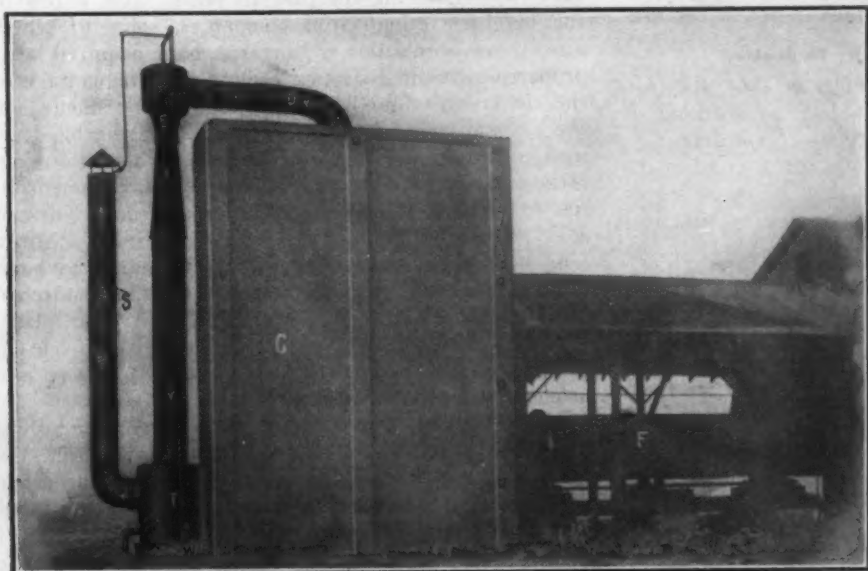


Fig. 1.—General View of the Koerting Obnoxious Vapor Condenser, Built by Schutte & Koerting Company, Philadelphia, Pa.

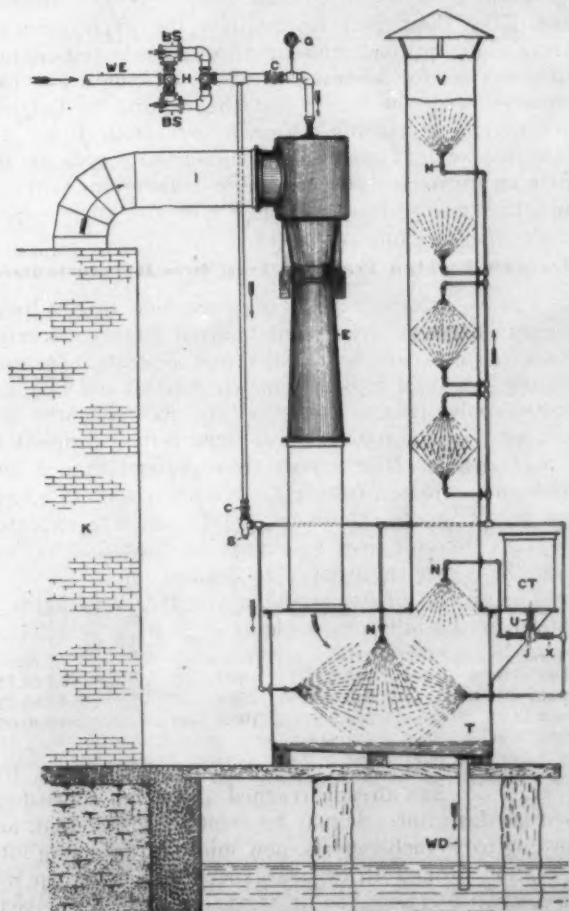


Fig. 2.—Sectional View Showing Details of the Condenser.

for abolishing fumes and objectional odors injurious to the health and otherwise undesirable which has attracted considerable attention in the fertilizer, chemical and allied industries is illustrated herewith. If desired it may be also employed as a mechanical medium to overcome the smoke nuisance.

The apparatus is extremely simple in design and operation, and at the same time it is said to be exceptionally efficient. Fig. 1 shows a general view of the apparatus, which in this case is applied to the washing of gases generated in a revolving mechanical dryer. The smoke, decomposed gases and obnoxious vapors are collected in the receiver C. The water spray blower, E, shown more clearly in the sectional view, Fig. 2, takes the smoke, gas or odor from the receiving chamber by the suction produced by forcing water from a pump at pressures varying from 60 to 90 lb. per square inch, according to the work to be done, through a spray nozzle. This water thus performs the work of an exhaust blower or fan, as the driving power of the water spray is used to create the necessary draft or suction by which the gases are removed, and also washes them and forces them down through the water spray in the condenser, which may be extended to any desired height and finally discharges into a tank at the bottom, with sufficient velocity to carry the unabsorbed gases and vapors up the adjoining stack in which they are finally absorbed before they reach the top.

This absorption is accomplished by a system of spray nozzles located in the stack, the number being dependent on the density of the gases or vapor to be absorbed. The water in the stack as well as the condenser absorbs and mechanically washes the gases. The accumulated waste in the receiver, which is also filled with spray nozzles for the final treatment of the gases, is discharged through trapped outlets to a sewer or to a suitable receiver if any by-products are to be recovered. In this apparatus the thorough separation of obnoxious odors is largely attributed to the exceptionally even atomization of the water in the condenser and the sprays which is done with the Koerting centrifugal spray nozzle. In cases where water alone is not sufficient to destroy the odors or neutralize the gases, chemicals reacting upon the gases are used for the final elimination. This is done by the Koerting water jet apparatus shown at J, Fig. 2, which forces the chemicals or disinfectants from the receptacle CT, and sprays them through a nozzle installed at the bottom of the chimney uptake. The system has many various forms and permits of considerable flexibility.

The American Bridge Company is now making a shipment from its plant at Ambridge, Pa., to Alaska. It comprises about 3000 tons of fabricated structural steel shapes, plates and other material, the contract for which was taken nearly a year ago from the Copper River & Northwestern Railway of Alaska by the United States Steel Products Export Company. This railroad is being built through copper and coal mining territory and the steel is for bridges.

Bird Furnace at Culbertson, Ohio, in the Hanging Rock District, which is now owned by the Lawrence Iron Company, is being overhauled and improved. It will be blown in about July 1.

THE DOOR OPENED FOR FREE SCRAP.

An Important Decision on Old Material That May Be Remanufactured by Hammering or Rolling.

A decision of no little importance to the iron trade was given by the United States General Appraisers at New York, April 4, in the matter of the protest of F. W. Myers & Co. against the assessment of duty on an importation of scrap by the collector of customs at the port of Burlington, Vt. It adds further complications to the situation created by the failure of the framers of the Payne-Aldrich tariff act to provide in terms a duty for scrap iron or steel apart from "waste or refuse iron or steel fit only to be remanufactured by melting." The decision is interesting in showing the opinion of the general appraisers as to the duty that should be levied on old material that is not fit for use for the purpose for which it was originally manufactured and yet is fit to be remanufactured otherwise than by melting. We give it below substantially in full, since it applies to a considerable amount of imported scrap. It will be seen that the general appraisers support neither the contention of the Government nor that of the importer. They present the alternative of admitting the scrap in question free of duty as "junk, old," paragraph 600 in the tariff act of 1909, or as "waste, not specially provided for," paragraph 479 of the same act, the duty in that case being 10 per cent. ad valorem.

If the query raised by the general appraisers at the end of their decision is answered in the affirmative free entry will be granted to a very considerable volume of scrap which can with little labor be rerolled into bars or other forms, directly competing with domestic rolling mill products manufactured from new raw materials.

Not Manufactured Articles.

FISCHER, General Appraiser: This protest involves the assessment of duty on merchandise invoiced as "scrap car axles," "scrap locomotive axles" and "scrap locomotive wheel tires." Duty was assessed at $\frac{3}{4}$ cent per pound, under paragraph 142, tariff act of 1909, as axles or parts thereof, and at $1\frac{1}{4}$ cents per pound under paragraph 171 of said act as iron or steel locomotive tires, respectively. The only claim urged is that the metal material is subject to duty at \$1 per ton under paragraph 118 as scrap iron or steel. It is not disputed by the protestants that the old metal is substantially in the form as reported by the local appraiser:

Car Axles.—Old worn-out car axles, owing to seamy journals, fillets worn out, or collars broken off or worn thin; they are all unfit for use as car axles in their present condition.

Other axles.—Old locomotive axles; they show much wear but are unbroken and still retain their manufactured form.

Tires.—Old locomotive tires all worn to the hazardous point; they are unbroken and still retain their manufactured form.

It appears that the merchandise was classified by the collector under the appropriate denominative provisions, on the ground that, as the old metal articles still retained their manufactured form, they were to be regarded for the purposes of the assessment of duty either as "axles" or as "tires." The Government in support of that action relies on the ruling of the board in G. A. 5325 (T. D. 24369). In that case, however, it was not shown that the merchandise was in fact old scrap, fit only for remanufacture. In the present case the record establishes the fact that the old metal material has lost its utility as "axles," "tires," &c., and that the articles cannot be used for the purposes for which they were manufactured originally, on account of being worn out by the wear and tear of long and continued use as railroad equipment. It is this very distinction that the board emphasized in holding steel rails of antique shape, pattern, &c., to be dutiable as steel rails. G. A. 6594 (T. D. 28175).

So far as old metal material or articles are in question, if they are still suitable for the purposes for which originally intended, and in case their availability for such use has not been destroyed by breakage or wear, they would be properly provided for under appropriate denominative provisions of the act, or under the catch-all clause of the metal schedule. *Dwight vs. Merritt* (140 U. S., 213); *Downing vs. United States* (122 Fed. Rep., 445), and *Illinois Central Railroad Company vs. McCall* (147 Fed. Rep., 925; T. D. 26639). If the metal material is either worn, battered, or broken, and thus unfit for its original purpose, it then becomes "old scrap." This board and the courts have held

such old forms of metal to be "scrap fit only to be remanufactured." *Ginsburg vs. United States* (147 Fed. Rep., 531; T. D. 27228) and G. A. 6214 (T. D. 26871).

Scrap Paragraph Does Not Apply.

Convinced that the assessment made on the merchandise is in error, and regarding the metal as "old scrap," we are then called upon to determine whether it falls within the provisions of paragraph 118, tariff act of 1909, as claimed. Scrap is a refuse or waste material which is to be remelted, or to be broken up by various methods and remanufactured into less valuable forms of metal. In the one case it is, so to say, reclaimed, and in the other it is manipulated and worked as metal into other forms. Under paragraph 122, tariff act of 1897, "scrap" was provided for as follows:

Wrought and cast scrap iron, and scrap steel, \$4 per ton; but nothing shall be deemed scrap iron or scrap steel except waste or refuse iron or steel fit only to be remanufactured.

That provision was broad enough to cover the metal material here in question, and the language then used to describe "scrap" was substantially the same as was used in the prior acts. Under the present act (1909) important qualifying words have been added, resulting in a radically different provision. Paragraph 118, tariff act of 1909, reads in respect to "scrap" as follows:

Wrought and cast scrap iron, and scrap steel, \$1 per ton; but nothing shall be deemed scrap iron or scrap steel except waste or refuse iron or steel fit only to be remanufactured by melting.

It will be noted that for metal to be suitable for remanufacturing purposes is under that wording not the only qualification. It must be fit only to be remelted; and the change not only expresses the intention of the framers of the act to limit the provision to a particular kind of scrap, but contemplates as well a waste or refuse which is suitable to be remanufactured by process other than by melting. That this is also commercially true is evidenced by the testimony offered. One of the witnesses states that the scrap may likely be used in the manufacture of tools, oil plungers and like articles. Again, the witness states that to obtain these products from the scrap, the metal is heated (not melted) and hammered out in the forms required; and as to the old axles, that they are cut in two, heated, and then rolled into bars. This clearly indicates that the old scrap is fit for remanufacture by process other than melting. That the provisions of paragraph 118 exclude that kind of scrap must be admitted, or the added words would be meaningless.

Paragraph 118 excepts from its provisions the scrap here in question by its express terms. The meaning of the phrase "fit only" has been held repeatedly to be exactly what the words imply. *Gardiner vs. Wise* (84 Fed. Rep., 337); *Train vs. United States* (107 Fed. Rep., 261), and *Swan vs. United States* (113 Fed. Rep., 243). In the *Train* case, the ruling of the circuit court affirmed the opinion of the board as expressed in G. A. 4406 (T. D. 20960), i. e., the phrase "fit only to be converted into paper" means "unfit for any other manufacture." The decision of the circuit court was affirmed in 113 Fed. Rep., 1020, and an application for writ of certiorari was denied by the Supreme Court of the United States. *Train vs. United States* (186 U. S., 483). In the *Swan* case (supra), Judge Lacombe, writing the opinion for the circuit court of appeals in that case, said:

The record abundantly sustains the contention of the importers that cod oil is commonly used for stuffing or dressing leather. Indeed, but a small fraction of it is used in the arts for any other purposes. But "common use" or "predominate use" is not the only qualification. The oil must also be one fit only for the enumerated uses.

As to the added words "by melting," they permit of but one meaning. Stated briefly, iron is made by putting ore into a fire that is hot enough to melt out the iron, and the use of the word "melting" in connection with the remanufacture of old scrap can have no different meaning.

A Free Entry Suggested.

This protest here before us urges no other claim than that under paragraph 118. It would be of interest, however, as the goods are not dutiable as assessed, nor as claimed, to inquire under what paragraph of the act the merchandise would find proper classification. There can be no doubt that a waste or refuse metal excluded from the scrap iron and the scrap steel paragraph, and fit only for remanufacture, cannot longer be considered a "manufacture," and is of necessity relegated to the provisions of the tariff act for "waste, not specially provided for," or for "junk, old." In *Sheldon vs. United States* (159 Fed. Rep., 105; T. D. 23602), old worn out iron chains, while conceded to be old junk, were held to be more specifically provided for in the paragraph covering scrap iron. We note the following excerpts from the opinion in that case:

It must be conceded at the outset that these chains are old junk.

If they are more specifically described in the iron paragraph than in the junk paragraph they fall within its provisions.

There is evidence that in the trade they are called both *scrap iron* and *junk*, the terms being used interchangeably.

Articles of iron are only one kind of junk. All scrap iron may be junk, but all junk is not scrap iron.

The query then would be, Is not old steel as well as old iron entitled to free entry as "junk, old" in all cases where the more specific provision, that of scrap iron or scrap steel, is found to be inapplicable?

The protest is overruled without affirming the decision of the collector.

Two Improved Air Hoists.

Although the air hoist in itself is not a new machine, its later development to a point of high efficiency has aroused the interest of those using this class of apparatus. It is in view of these later improvements that the air hoist is very favorably considered for a large variety of uses, and, in fact, in many places is looked upon as indispensable.

The cylinder or plunger type hoist was used with the early application of compressed air to hoisting work, and following this the geared engine or motor type was introduced. This latter type was found to be very much superior to the cylinder or plunger type owing to the smaller amount of head room required, the increased height of lift and better regulation. There were, however, some features which were found objectionable in the geared type, and the foremost of these was the inability of the hoists to hold their load for any length of time at any point because of the leakage in the valves and the lack of adequate lubricating facilities for the cylinders. It was necessary, therefore, to overcome these features before the geared air hoists could be accepted as a safe, dependable and economical machine.

The accompanying illustrations show two of a line

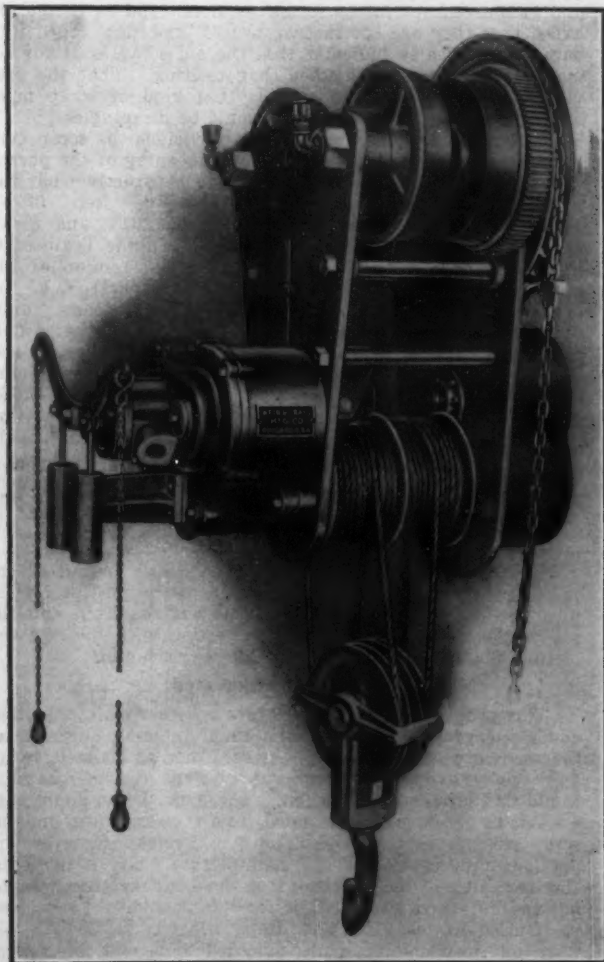


Fig. 1.—A Combined Compressed Air Geared Hoist and Trolley, Built by Weir & Craig Mfg. Company, Chicago, Ill.

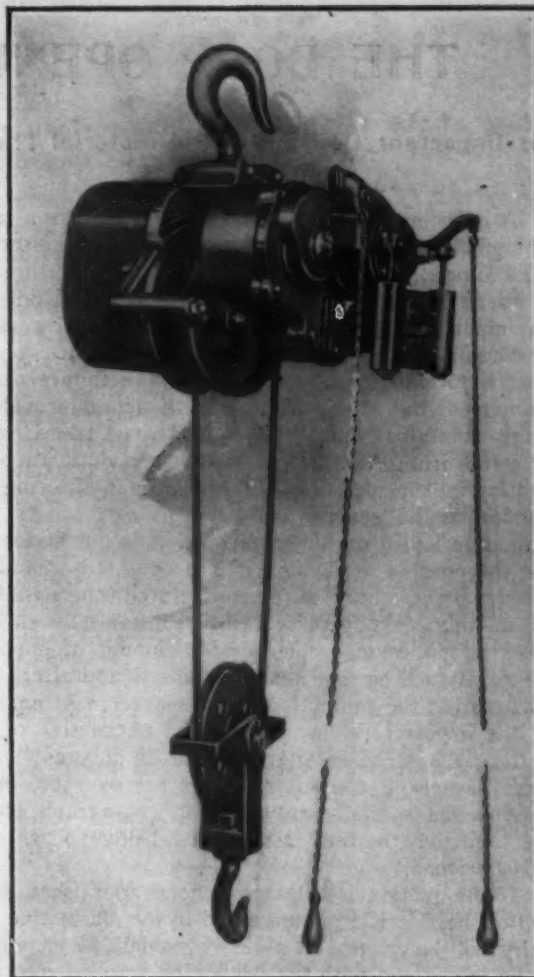


Fig. 2.—Compressed Air Geared Hoist, Capacity 4000 Lb.

of geared air hoists manufactured by Weir & Craig Mfg. Company, Chicago, Ill., which seem after several years of severe tests to have overcome the troublesome characteristics heretofore encountered, and also to have added some valuable new features. In these geared hoists the admission of the air to the cylinders is controlled by a flat disk valve of large proportions, which is scraped to a perfect fit. It is claimed that there can be no leakage, and therefore when the valves are closed no air is admitted to or can exhaust from the cylinders which prevents any movement of the pistons. It can be readily seen that in this way there is a vacuum formed on one side of the piston and an air cushion on the other, which so long as it is maintained will hold the load at the point of stopping, and furthermore as the valves are closed it will not affect the holding qualities if the air supply is cut off. Therefore the danger of accident due to the load falling if the air supply is interrupted is, it is claimed, eliminated.

The automatic oiling system with which these hoists are equipped admits a little oil to the valves and cylinders each time the hoist is started or reversed. An even lubrication is thereby assured, and the wear is reduced to a minimum, thus preventing the valves and cylinders from becoming leaky and defective. Absolutely tight cases have been provided for all the working parts, which run in a bath of oil. All these improvements, it is said, assure a continuous supply of oil at all times, and a machine in ordinary use will not require attention for weeks.

In the construction of these hoists all the gears are cut from hammered steel, and forged nickel steel is employed for the cranks, and all bearings are bronze bushed throughout. As far as possible the construction is foolproof, compact, and as light as is consistent with the required strength. All parts are made interchangeable, and should repairs be required they can be made without the aid of skilled mechanics.

The Present Status of the Electric Steel Industry.

A List of the Installations in American and European Works, with Data as to the System Employed, the Capacity and Character of Product.

An interesting compilation is made by *Stahl und Eisen* in its issue of March 23, 1910, of the existing electric furnaces, or those under construction, at steel plants in Europe, the United States, Canada and Mexico. It is reproduced below, with its details of capacity in kilograms, the power available, the character of the charge and the use to which the product of the electric furnace will be put. Had the publication been delayed a little the list of furnaces in the United States might have been longer. Contracts for two installations, at least, are about to be closed, in addition to the "unnamed American works" which appears in the tabulation. It will be noted that two Mexican plants are reported as building, one after the Roechling-Rodenhauser, and the other after the Heroult system.

A summation of the tables is given, showing 114 furnaces of all types, of which 67 are working, 11 not working and 36 in course of construction. Of the furnaces in operation or under construction, 29 are Heroult, 12 Kjellin, 2 Kjellin-Colby, 14 Roechling-Rodenhauser, 17 Girod, 6 Stassano, 5 Chaplet and 4 Aktiebolaget Electrometal.

System.	No.	Company.	Work- ing.	Not work- ing.	Build- ing.	Current.	Kilowatts.	Method of charging.	Application of product.
			Capacity in kilograms.						
(A) ARC FURNACES.									
Heroult.*	1.	Stahlwerk Richard Lindenberg, A. G., Remscheid-Hasten, Germany.....	1,800	....	....	Single-phase alternating current.	400	Molten metal from O. H. furnace, also cold charge.	Tool steel, structural steel, war materials. War material. high silicon dynamo steel, locomotive tires.
	2.	Ditto	3,000	....	....	"	520	"	
	3.	Bismarckhütte, Upper Silesia, Germany.	1,000	....	....	"	400	"	
	4.	Ditto	3,000	....	....	"	540	"	
	5.	Mannesmannröhren Werke, Burbach, Germany	3,000	....	....	"	570	"	Drawn tubes, steel castings.
	6.	Gewerkschaft "Deutscher Kaiser," Bruckhausen, Germany.....	....	....	6,000	"	800	Cold and molten open hearth metal.	Drawn tubes, rails, medium quality, all kinds.
	7.	Ditto .....	....	....	6,000	"	800		
	8.	Gebr. Bühler & Co., A. G., Kapfenberg, Austria	2,500	....	....	"	400	"	Tool steel, structural steel, war material. Rolled wire.
	9.	Kärntnerische Eisen und Stahl-werks- Ges., Ferlach, Austria.....	5,000	....	....	"	765	Cold charge.	Dynamo stampings and fine sheets, steel castings. Steel castings.
	10.	Brüder Lapp, Rottenmann, Austria....	6,000	....	....	"	785	"	
	11.	Georg Fischer, Schaffhausen, Switzer- land	1,200	....	....	"	250	"	
	12.	Società Tubi Mannesmann, Dalmine, Italy .....	....	....	6,000	"	765	"	Drawn tubes.
	13.	Ditto .....	....	....	6,000	"	765	"	
	14.	Soc. Electrometallurgique Française, Froges, France.....	2,500	....	....	"	400	"	Tool steel.
	15.	Aciéries du Saut du Tarn, St. Juéry, France	5,000	....	....	"	500	Molten open hearth metal.	"
	16.	Usines Métallurgiques du Hainaut, Cou- illet, Belgium.....	....	....	5,000	"	400	"	Steel castings.
	17.	Edgar Allen & Co., Sheffield, England..	....	....	2,500	"	400	"	Tool steel.
	18.	Vickers, Sons & Maxim, Sheffield, Eng- land .....	....	....	2,500	.....	....	....	.....
	19.	Obuchoff Steel Works, St. Petersburg, Russia	3,500	....	....	"	660	Molten open hearth metal.	Shipbuilding.
	20.	Aktiebolaget Hérault Elektriska Stål, Kortfors, Sweden.....	3,500	....	....	"	400	Cold charge.	Tool steel.
	21.	Holcomb Steel Company, Syracuse, N. Y.	5,000	....	....	"	....	Molten pig iron.	"
	22.	Firth-Sterling Steel Company, McKees- port, Pa.....	2,500	....	....	"	....	Molten O. H. metal.	"
	23.	Ditto .....	....	....	5,000	"	....	....	.....
	24.	Illinois Steel Company, South Chicago, Ill.	15,000	....	....	Direct current.	2,000	Molten Bessemer metal.	Railway material.
	25.	American Steel & Wire Company, Wor- cester, Mass.....	15,000	....	....	.....	2,000	Ditto.	Rolled wire.
	26.	Electro Metals, Ltd., Welland, Ontario.	500	....	....	.....	....	.....	.....
	27.	Ditto .....	....	....	5,000	.....	....	.....	.....
	28.	Cia Mexicana di Acero y Productos Chi- micos, Mexico.....	....	....	4,000	.....	....	.....	.....
	29.	Ditto .....	....	....	4,000	.....	....	.....	.....
Girod.	1.	Cie des Forges et Aciéries Electriques Paul Girod, Ugine, France.....	1,800	....	....	Single-phase alternating current.	300	Cold charge.	Ordinary & special steels, steel castings.
	2.	Ditto	2,000	....	....	"	300		
		to	3,000	....	....	"	400		
	3.	Ditto	2,000	....	....	"	300		
		to	3,000	....	....	"	400		
	4.	Ditto	2,000	....	....	"	300		
		to	3,000	....	....	"	400		
	5.	Ditto	8,000	....	....	Direct current with four electrodes.	1,200	Cold and molten charge.	Steel castings.
		to	12,500	....	....	"	1,200		
	6.	Ditto	8,000	....	....	"	1,200		
	to	12,500	....	....	.....	....	Cold and molten charge.	Ordinary and special steels.	
7.	Marrel Frères, Rive de Gier, France...	....	....	5,000	Single-phase alternating current.	600			
8.	Oehler & Co., Aarau, Switzerland.....	2,000	....	....	"	300			
9.	Soc. John Cockerill, Seraing, Belgium..	3,000	....	....	"	450			
	to	4,000	....	....	.....	....
	to	4,000	....	....	.....	....

* Besides the pig iron production from three Hérault furnaces working at Welland and Sault Ste. Marie, Canada, and Hérault-on-the-Pitt, California.

System.	No.	Company.	Work- ing.	Not work- ing.	Build- ing.	Current.	Flows (a.)	Method of charging	Application of product.
Gilrod	10.	A. Stotz, Stuttgart-Kornwestheim, Ger- many	2,000	.....	2,000	Single-phase alternating current.	300	Cold charge.	Steel castings.
	11.	Gutehoffnungshütte, Oberhausen, Ger- many .....	.....	.....	2,000 to 3,000	"	300 to 400	Cold and molten charge.	High quality steel.
	12.	Stahlwerk Becker, Krefeld, Germany...	.....	.....	2,000 to 3,000	"	300 to 400	"	"
	13.	Fried. Krupp, A. G., Essen a. d. Ruhr, Germany .....	.....	.....	10,000 to 12,500	"	.....	"	"
	14.	Ternitzer Eisen und Stahlwerke, Schoel- ler & Co., Ternitz, Austria .....	.....	.....	500	"	.....	"	Tool steel and high quality steel.
	15.	Danner & Co., Judenburg, Austria .....	.....	.....	1,800 to 2,000	"	300	Cold charge.	"
	16.	Diosgyör Sgl. Eisen und Stahlwerke, Diosgyör, Hungary .....	.....	.....	2,000	"	300	"	Tool steel.
	17.	Unnamed American works .....	.....	.....	500	"	.....	.....	.....
Stassano	1.	Fornl Termoelettrici Stassano, Turin, Italy .....	.....	100	.....	Alternating current.	80	Cold charge.	Special steels.
	2.	Ditto .....	.....	400	.....	"	80	"	"
	3.	Ditto .....	.....	1,000	.....	Direct current.	200	"	Steel castings, automobile steel.
	4.	Ditto .....	.....	1,000	.....	"	200	"	"
	5.	Ditto .....	.....	800	.....	"	150	"	"
	6.	Ditto .....	.....	5,000	.....	"	800	"	"
	7.	Ditto .....	.....	5,000	.....	"	800	"	"
	8.	Royal Arsenal, Turin, Italy .....	.....	800	.....	"	150	"	Material for artillery and projectiles.
	9.	Ditto .....	.....	800	.....	"	150	"	"
	10.	Rheinische Elektrostahlwerke G. m. b. H., Bonn, Germany .....	.....	1,000	.....	"	200	"	Steel castings, tool steel.
	11.	Ditto .....	.....	1,000	.....	"	200	"	"
	12.	Leopold Gasser, St. Pölten, near Vienna.	.....	1,000	.....	"	200	"	Steel cast'gs and high q'lity steel.
	13.	Ditto .....	.....	1,000	.....	"	200	"	"
Keller	1.	Acieries J. Holtzer, Unieux, France....	8,000	.....	.....	Single-phase alternating current, four electrodes in pairs.	750	Molten O. H. metal.	High quality and war material, special steel, steel castings.
	2.	Ditto .....	.....	1,500	.....	Single-phase alternating current, one electrode.	200	Molten O. H. metal and cold charge.	High quality mate- rial, special and tool steel.
	3.	Société des Etablissements Keller-Le- leux, Livet, France	1,500	.....	.....	"	200	Cold charge.	High quality material, special steel, and steel castings.
	4.	Ditto	3,500	.....	.....	"	450	"	For experimental purposes.
	5.	Ditto	200	.....	.....	"	80	"	"
	6.	Luxemburger Bergwerks und Saarbrück- er Eisenhütten, A. G., Burbacherhütte, Saarbrücken, Germany .....	.....	3,500	.....	Single-phase alternating current, one electrode and hearth electrode.	450	Molten basic metal.	Medium quality rails, structural steel.
Chaplet	1.	Soc. des Hauts Fourneaux et Forges, Allevard, France	3,500	.....	.....	Single-phase alternating current.	340	Cold charge.	Ordinary special steels.
	2.	Ditto	3,500	.....	.....	"	340	"	"
	3.	Ditto	5,000	.....	.....	"	600	"	"
	4.	Ditto	5,000	.....	.....	"	600	"	"
	5.	Ditto .....	.....	5,000	.....	"	600	"	"
Aktiebolaget Elektrometall, Ludvika (Sweden)	1.	Arvika, Sweden	1,000	.....	.....	Direct current.	175	Cold charge.	Temper steel.
	2.	Hagfors, Sweden	500	.....	.....	Two-phase current.	125	"	"
	3.	A. S. Norsk, Elektrometall, Nor- way .....	.....	6,000	.....	"	736	Molten charge from electric smelting furnace.	.....
	4.	St. John del Rey Mining Co., Brazil .....	.....	2,000	.....	"	300	Cold charge.	.....
Co.'s System.	1.	A Hickman, Staffordshire, England	300	.....	.....	.....	.....	.....	.....
Co.'s system.	1.	Soc. An. des Acieries et Forges, Flr- miny, France	50	.....	.....	.....	.....	.....	Experimental furnace.
Co.'s system.	1.	Scott Anderson, Sheffield, England.	750	.....	.....	.....	.....	.....	.....

* In addition, for the production of pig iron the following furnaces on this system are operating: One furnace at Domnarvet, Sweden, at work with a yearly production of 2500 tons at a power of 400 kw. direct current; in course of construction at the A. S. Norsk Elektrometall, Norway, two furnaces of 1850 kw. and a yearly production of 7500 tons for each furnace; and one furnace of the same capacity at Trollhättan, Sweden.

(B) INDUCTION FURNACES.

System of the Gesellschaft für Elektrostaht- anlagen m. b. H., Berlin-Nommandamm, Ger- many, KJellin.	1.	1. Fried. Krupp, A. G., Essen a. d. Ruhr, Germany	8,500	.....	.....	Single-phase alternating current.	750	Cold charge.	High quality steel.
	2.	2. Oberschlesische Eisenindustrie, A. G., Gleiwitz, Germany	1,500	.....	.....	"	180	"	"
	3.	3. Poldihütte, Kladno, Austria	4,000	.....	.....	"	400	Molten O. H. metal.	"
	4.	4. L. Braun's Sohne, Vöcklabruck, Austria	400	.....	.....	"	65	Cold charge.	"
	5.	5. Vickers, Sons & Maxim, Sheffield, England	1,500	.....	.....	"	230	"	"
	6.	6. Ditto	180	.....	.....	"	100	"	"
	7.	7. Wm. Jessop & Sons, Sheffield, Eng- land	1,800	.....	.....	"	250	"	"
	8.	8. Alti Forni Gregorini, Loreve, Italy ..	1,800	.....	.....	"	330	Molten O. H. metal and cold charge.	Tool steels.
	9.	9. Vidua de Urigoitia e Hijá, Araya, Spain	1,500	.....	.....	"	215	Cold charge.	High quality steel.
	10.	10. Eisenwerk Domnarvet, Gysinge, Sweden	1,500	.....	.....	"	175	"	"
	11.	11. Sybry Searis, Ltd., Trollhättan, Sweden	2,000	.....	.....	"	300	"	"
	12.	12. General Electric Company, Sche- nectady, N. Y.	60	.....	.....	"	50	.....	.....
	13.	13. Irvington Smelting & Refining Company, Irvington, N. J.	300	.....	.....	"	60	.....	.....
	14.	14. Electric Steel Company of Canada, Ltd., Welland, Ontario	750	.....	.....	"	150	Cold charge.	Tool steel.

System.	No.	Company.	Work- ing.	Not work- ing.	Build- ing.	Current.	Kilowatts.	Method of charging	Application of product.
			Capacity in kilograms.						
System of the Gesellschaft für Elektrostahlwerke m. b. H., Berlin-Nomaden, Germany—Rochling-Rodenhauser.	15.	1. Röchlingsche Eisen und Stahlwerke, Volklingen, Germany....	7,000	....	....	Single-phase alternating current.	750	Molten basic metal.	High quality material, rails, &c.
	16.	2. Ditto	2,000	....	....	Direct current.	275		
	17.	3. Ditto .....	....	....	2,000	"	275		
	18.	4. Ditto .....	....	....	2,000	"	275	Cold charge.	Steel castings.
	19.	5. Pilger & Neidhardt, Frankfurt a. M., Germany.....	....	....	2,000	Single-phase alternating current.	275		
	20.	6. Bergische Stahlindustrie, Remscheid, Germany.....	5,000	....	....	"	500		
	21.	7. Le Gallais, Metz & Co., Dommeldingen, Luxemburg.....	3,500	....	....	"	380	Molten O. H. metal, Molten pig iron from mixer.	High quality steel.
	22.	8. Ditto	3,500	....	....	"	380		
	23.	9. Ditto	700	....	....	"	100		
	24.	10. Ditto .....	....	....	1,500	Direct current.	275	Molten or cold charge.	High quality steel. Steel castings. War material.
	25.	11. Ditto .....	....	....	3,500	Single-phase alternating current.	380		
	26.	12. Aciéries de la Marine et d'Homécourt, St. Chamond, France.....	....	....	3,000	Direct current.	350		
	27.	13. Aciéries Liégeoises, Bressoux-les-Liège, Belgium.....	....	1,000	....	Ditto.	200	Cold charge.	
	28.	14. Kropwerke Zlotouosh, Russia....	....	....	1,000	"	175		
	29.	15. Richard Honey, Mexico.....	2,500	"	300	Molten pig iron with ore additions.		High quality steel.
Kjellin Colby.	30.	1. American Electric Furnace Company, Niagara Falls, N. Y....	750	....	....	Single-phase alternating current.	150	....	....
	31.	2. Ditto	100	....	....	"	60	....	....
Frick.	Germany		10,000	....	....	Single-phase alternating current.	750	....	....
	1.	Fried Krupp, A. G., Essen a. d. Ruhr,							
Schneider.	1.	Schneider & Co., Creusot, France.	1,000	....	....	....	....	....	Experimental furnace.
Hiorth.	1.	Norway .....	....	?	....	....	....	....	....
Co.'s own system.	1.	Forges de St. Jacques, Montluçon, France	?	....	....	....	....	....	....
(C) COMBINED ARC AND RESISTANCE FURNACES.									
Nathusius.	1.	Oberschlesische Eisenbahn-Bedarfs, A. G., Friedenshütte, Germany.....	5,000	....	....	Three-phase alternating current.	750	Molten metal from converter or O. H. furnace. Solid or molten basic O. H. metal.	Soft and hard quality steels. For experimental work.
	2.	Ditto	1,000	....	....	Ditto.	250		

Mert on's Copper Production Statistics.

Henry R. Merton & Co., London, England, have issued a table entitled "Principal Copper Supplies," giving the production of copper credited to each country from 1890 to 1909, from which the figures for the last three years are taken, as follows:

	Gross tons.		
	1909.	1908.	1907.
Africa	14,945	6,880	6,800
Argentina	600	225	220
Australasia	34,400	39,500	41,250
Austria	1,615	1,575	920
Bolivia	2,000	2,500	2,500
Canada	24,105	28,570	25,615
Chili	35,785	38,315	26,685
Cuba	2,675	3,000	.....
England	700	700	700
Germany	22,455	20,200	20,490
Hungary (including Bosnia and Serbia) ..	4,505	2,240	125
Italy	2,725	2,975	3,300
Japan	47,000	43,000	48,935
Mexico	56,240	39,990	56,565
Newfoundland	1,380	1,430	1,730
Norway	9,080	9,190	7,010
Peru	16,000	15,000	10,575
Russia	17,750	20,085	15,000
Sweden	2,000	2,000	2,000
Spain and Portugal....	52,185	52,585	49,675
Turkey	800	1,050	1,250
United States.....	490,310	423,300	392,520
Totals.....	839,255	754,310	713,865

The Dominion Coal Company's Report.

The Dominion Coal Company, Sydney, Nova Scotia, has issued its annual report for the year ending December 31, 1909. The net profits were \$1,113,091, as compared with \$2,686,202 in 1908. The balance, after deductions for interest and depreciation, was \$450,525. Preferred dividends of \$210,000 and common dividends of \$600,000 were paid, leaving a deficit of \$359,475, against a surplus of \$1,600,162 in 1908. The total surplus at the close of 1908 was \$4,253,471, from which not only the deficit was taken but also the payment to the Dominion Iron & Steel Company of \$3,550,000 as per arrangement to settle matters in dispute between

the two companies, leaving a surplus of \$394,419, after a slight credit adjustment.

From President J. H. Plummer's accompanying statement the following extracts are taken: "The year opened with great promise, but early in the year a strike was called by the United Mine Workers' Association. The reduction in output, consequent on the strike, the increased cost of mining, police protection, &c., all had a serious effect on the company's earnings. The output is now nearly normal, and it is hoped that operations will be on their usual level by the opening of navigation. The arrangement proposed by the directors for a settlement of the matters in dispute with the Dominion Iron & Steel Company was duly carried out. The contract of October 20, 1903, has been reinstated and the excess cost of coal received under the temporary contract repaid."

It is understood that a plan to unite the interests of the shareholders of the coal and steel companies is under consideration, and will shortly be submitted to their representatives.

The Woodstock Furnaces Sold.—The Anniston Iron Corporation has been chartered by the State Corporation Commission of Virginia with an authorized capital of \$600,000 and has taken over the Woodstock blast furnaces and ore property at Anniston, Ala. The sale of the property was approved April 7 by the United States Court at Birmingham, Ala. The directors of the new company are H. E. McWane, Ernest Williams, Lawrence H. McWane, J. M. Barr, F. S. Kirkpatrick, W. C. Ivey and W. R. Bonsal. H. E. McWane is president; Ernest Williams, vice-president, and Lawrence H. McWane, secretary and treasurer. The principal office will be in Lynchburg, Va. New blowing engines are to be installed at once, and one furnace is to be put in blast as soon as practicable.

A. Bacarisse, formerly in the sheet metal brokerage business, is now representing the Follansbee Brothers Company, Pittsburgh, manufacturer of sheets and tin plate in Louisiana and Texas, having offices at 826-828 Perdido street, New Orleans, La.

Large Panama Shops and Foundry.

The Gorgona shops and foundry, operated in connection with the construction work on the Panama Canal, comprise a plant large enough to go into competition with many good sized manufacturing establishments in the United States. An excellent idea of the opportunities for selling machinery and supplies for that plant can be had from the following interesting description of the operations at the works, taken from the *Canal Record*:

The output of Gorgona shops and foundry at present is greater than ever before. Twelve hundred men are employed, and a night force has been placed at work in the boiler and machine shops. Night work will be begun in the blacksmith shop as soon as a sufficient force is recruited. The bulk of the regular work is on locomotive and car repairs.

The Foundry.

On account of the increased demand for gray iron castings, an extension 18 ft. wide and 145 ft. long, the full length of the building, has been made to the foundry, and additional room will be procured within the next few weeks by the removal of the brass foundry into the old pattern storage shed, which will be vacated when the new pattern shed is completed. A concrete pit is to be constructed near the iron cupolas, in which molds for heavy castings will be made, for the purpose of protecting molds from water which seeps in from the river during floods. Near this pit, and swinging over it, will be erected a 10-ton jib crane on which ladles full of molten metal will be swung from the cupolas over the pit and over other molds made near the pit.

The largest pieces of work on which the foundry is now engaged are castings for caisson seats in the locks, and castings to serve as linings for Stoney gate chambers in the locks. It is expected that an order will be received in the near future for 1,244,000 lb. of counterweights for the regulating gates in the spillway of Gatun Dam. The output of gray iron castings in January was 466,830 lb., for which a charge of 3 cents a pound is made. This output will be increased about 20 per cent., when the changes referred to above have been made. In the new brass foundry, there will be installed three oil burning melting furnaces. The output of brass and bronze castings in January was 31,304 lb., for which a charge of 18 cents a pound is made. The prices quoted for brass and iron castings include the cost of supervision, plant charges, and all pattern shop work. There were 138 patterns made during the month.

The Boiler Shop.

The manufacture of collapsible steel forms for the locks at Gatun and the D street sewer in Colon is the most elaborate work in progress in the boiler shop. Four of six 90-degree elbow forms, for the connections between the culverts in the floor of the locks and the main culverts in the center wall, have been completed. These forms are elliptical in section, and are built on a 19 ft. 3 in. center line radius, the elliptical diameters being 6½ ft. and 8 ft. They are made of ¼-in. steel plate and weigh 13,000 lb. each. Delivery has been made of part of the order for 18 collapsible steel forms for the Colon sewer. Each of these forms is 10 ft. long, circular at the bottom and rectangular at the top, and from 5 ft. to 7 ft. 10 in. in diameter. A number of collapsible steel manhole forms for the sewer are also being manufactured.

Work is also in progress in the boiler shop on 12 4-ton derricks, to be erected on the steel towers of the side wall forms at Gatun Locks, for handling the girders that are a part of the wall forms. Two derricks will be erected on each tower, and will be run by an electric hoist. The boom of each is a 46-in. stick, and the rest of the derrick is of structural steel. Other pieces of work

in process of manufacture are pontoons and pipe for the 20-in. suction dredges, and automatic measuring tanks for the concrete plant at Gatun. The output of the boiler shop in January was 300 tons of structural steel in new work, in addition to repair work on various pieces of equipment.

The work in the smith shop is running a little larger than in January, when 150 tons of new forgings were made, in addition to repairs to various equipment, which formed about 20 per cent. of the work. One thousand pounds of thermit were used for welds in iron castings, patching erosion holes in pump casings, and on locomotive castings. The shop is now equipped with 18 coal fires, a coke furnace used in the manufacture of locomotive driving springs and similar work, and nine furnaces using crude oil as fuel, two of which are designed for heavy forgings.

The Colburn Machine Tool Company.

The Colburn Machine Tool Company, Franklin, Pa., reports a gradual improvement in its business. The adjoining 65 x 215 ft. two-story building which it recently acquired by purchase is now being stocked with assembled machinery ready for shipment. An industrial railroad system from the main machine shop and a standard gauge track in front of the building afford good shipping facilities. Light manufacturing will be done in this building, while the assembling department in the old building will have its capacity doubled.

The entire plant is now being operated to fair capacity on medium and smaller sized boring mills for miscellaneous shop uses. A recent order was from a large Western railroad for a 54-in. boring mill. The company is furnishing an outfit of tools for gas engine flywheels which has proved very successful. The boring mill used is provided with two regular tool heads and a central boring spindle. The latter is revolved independently of the table, so as to give the proper cutting speed to the tools which finish the bore at the same time that the rim is being machined. In the first operation a tool in one of the heads turns the outside diameter of the rim. Simultaneously a box tool held in the other head faces both edges of the rim, the wheel being mounted in a special fixture which holds it firmly but allows these cuts to be taken simultaneously. At the same time, also, the central boring spindle is roughing out the bore with an inserted blade boring bar. By the time the operations on the rim are finished, a roughing and finishing boring cut has been taken in the hub and the reaming is in progress. For the reaming the company's special floating holder is used. The final operation consists in facing the hub with an inserted blade holder, steadied by a pilot in the bore and chamfering all four edges of the rim inside and out. With this outfit of tools the following rate of production has been found practicable: 22-in. wheels, 15 minutes complete; 26-in. wheels, 18 minutes; 30-in. wheels, 20 minutes; 36-in. wheels, 23 minutes; 42-in. wheels, 25 minutes apiece.

The Edgar Allen Manganese Steel Company.—To meet the constantly increasing demand in America for their Stag brand manganese steel products and particularly for railroad frogs and crossings, Edgar Allen & Co., Ltd., of Imperial Steel Works, Sheffield, England, are at present engaged in the erection and equipment of an up-to-date and very extensive plant at Chicago, Ill., for the manufacture of their specialties. This branch of their organization has just been incorporated at Springfield, Ill., under the name of Edgar Allen Manganese Steel Company, with a capital stock of \$300,000. Edgar Allen & Co., Ltd., maintain a sales office at 434 West Randolph street, Chicago.

New Engine Stop for Corliss Engines.

Single's Automatic Engine Stop and Overload Controller.

Mechanical engineers are well aware that all Corliss engines of the present day are provided with

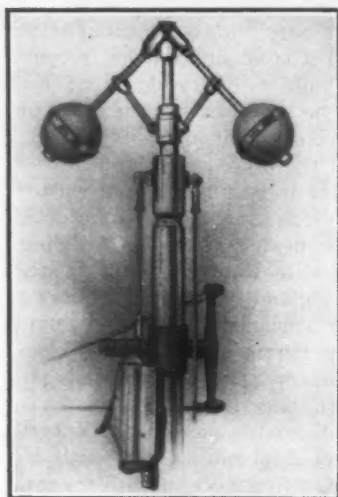


Fig. 1.—Single's Automatic Engine Stop Placed Under the Governor Crosshead.

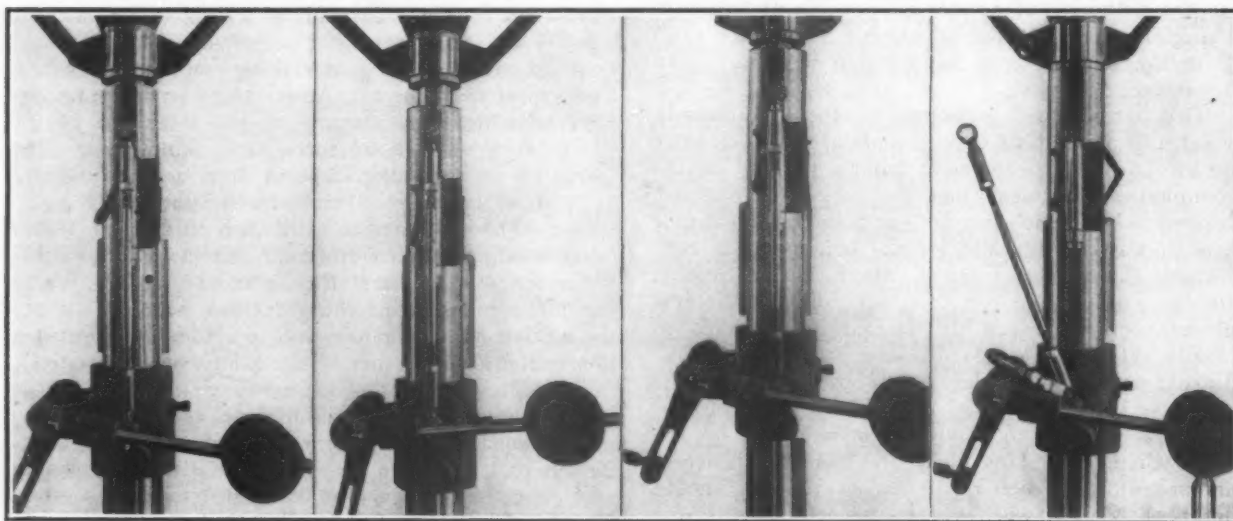
safety devices, whereby in case of the breaking of governor belt or the stopping of the governor the steam is shut off from the cylinder. With all these devices it is necessary to provide means for holding up the governor at its point of maximum cut-off when the engine is shut down. This is usually done by the attendant throwing a stop in position just before shutting down, which should be removed when the engine is started

the governor at its position of maximum cut-off when the engine is at rest.

When the engine is started up again and the governor rises, this small lever drops out automatically, taking the position shown in Fig. 3 and putting the engine in the safety position. In the event of the governor belt breaking or the stopping of the governor, the entire weight of the governor coming down upon the device compresses it as shown in Fig. 5, allowing the governor to drop into its safety position, putting the safety plates in use and shutting the steam from the cylinder.

The intelligent engineer in charge of engines subject to heavy overloads understands thoroughly the danger in having the stop pin in his governor column, but he is absolutely forced to do so by the condition of his load. The overload feature of this device will appeal strongly to him, because with it he can carry his engine over peak loads sufficiently to reduce the engine speed 25 per cent. and at all times feel secure in the fact that in case of the governor belt breaking his governor will drop into the safety position.

This is accomplished by adjusting the overload or coil spring shown in the sectional view, Fig. 7, so that it will carry without collapsing the weight due to a decrease in speed of the desired number of revolutions. Any further weight due to the belt breaking or the stopping of the governor will immediately collapse this spring, pushing out the toggle joint, causing the device to take the position shown in Figs. 5 and 7. This



Placed Under Parallel Rod of Governor.

Position Immediately After Governor Rises.

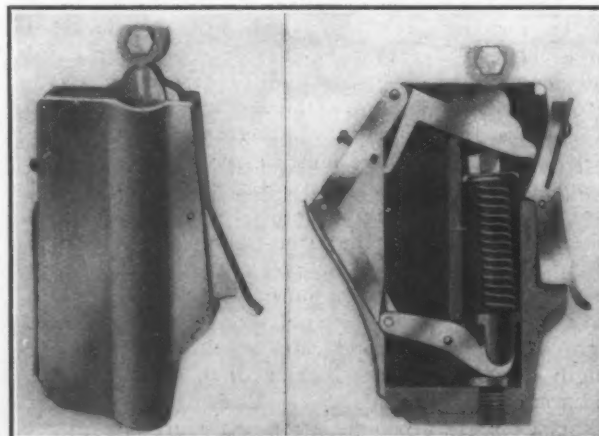
Position of Governor When Carrying Overload.

Governor at Safety Position.

Figs. 2, 3, 4 and 5.—Four Views of Single's Automatic Engine Stop, Made by Oscar D. Dillman, Hamilton, Ohio.

up again and the governor rises. When heavy overloads are met with there is great danger of the governor dropping below the point of maximum cut-off, thereby bringing the safety device into action and shutting down the engine.

It is because of this condition that the engineer frequently leaves in the stop pin or fastens the device, whatever it may be, in position while the engine is running, in spite of the possibilities of disaster to the plant in the event of the governor belt breaking or the stopping of the governor. To guard against such a condition a safety device was invented, known as the Single's automatic engine stop and overload controller, which has been placed on the market by Oscar D. Dillman, Hamilton, Ohio. The construction and use of the stop are shown in the accompanying engravings. It may be placed under the crosshead of the governor, as shown in Fig. 2, or under the parallel rod of the governor, as shown in Fig. 1. This device really combines two different functions. When the engine is at rest and the small lever at the left side of Fig. 1 is in position as shown, it acts the same as a stop pin, holding



Figs. 6 and 7.—Exterior and Sectional Views of Stop, Showing Position When Engine Is at Rest and When Stop Has Operated.

position of the governor will cause the safety cams to come into action and shut the steam from the cylinder.

This automatic engine stop and overload controller, it is stated, is the result of 10 years' constant study and testing on the part of the practical engineer, and it is simple, durable, certain in operation, and has direct and sure control over the engine. Furthermore, it is claimed that it can be fully depended upon to automatically stop the engine in case of emergency or accident, thus preventing the engine from running away, exploding the flywheel and causing loss of life and untold damage to property. The carrying of an overload with perfect safety without the use of a stop pin, which now is such a hazardous risk, is permitted. At the present time this device has been adopted in some of the largest rolling mills, paper mills and street railway power stations. It is stated that any engineer or mechanic can place it on the engine in 30 minutes, and after being set it requires no further attention.

Canadian Developments.

Canada's New Dry Dock Subsidy Policy.

TORONTO, April 9, 1910.—The Dominion Government's proposals in aid of shipbuilding here have been outlined in a resolution of which notice was given by the Finance Minister several days ago. This resolution, which will be the substance of a bill that is to follow, provides for the construction of dry docks on a grand scale. At the present time the Government has the authority of an act of Parliament to pay a subsidy of 3 per cent. per annum for 20 years on capital outlay in dry docks aggregating not more than \$1,500,000.

This arrangement, sufficient for the conditions to be satisfied at the time of its adoption, is not adequate for the purposes of the naval policy upon which the Dominion Government has this session embarked. The naval bill, which has not yet fully run its course through Parliament, calls for the building of a considerable squadron, of which the estimated cost is from \$15,000,000 to \$18,000,000, according as the vessels are constructed in the United Kingdom or in Canada. It is the expressed desire, both of the Prime Minister and of the leader of the opposition, that the vessels be built in Canada. Another object of Canadian naval policy is to provide accommodation for the largest British warships afloat, and to make all necessary provision for their repair and overhauling should they be in need of such treatment when on this side of the Atlantic. Hence it has been decided to give liberal assistance to private capital applied to the construction of the largest dry docks.

Dry Docks of Three Classes.

Mr. Fielding's resolution deals with dry docks of three classes. The first includes dry docks for naval and general purposes, that shall be of a clear length of 900 ft. in the bottom, of an entrance width of 100 ft. and of a depth of 35 ft. In the case of floating dry docks of this class there must be room enough to accommodate vessels of at least 25,000 tons displacement. This first class of dry docks must be capable of receiving and repairing the largest ships of the British Navy. The subsidy for dry docks of this class is to be 3½ per cent. per annum during a period of 35 years on a total capital outlay not exceeding \$4,000,000. Dry docks of the second class are to be of a clear length of 650 ft. on the bottom, of a width of 85 ft. and a minimum depth of 18 ft. Floating dry docks of this class must accommodate vessels of a displacement of at least 15,000 tons. The subsidy for this class is to be 3½ per cent. per annum for 25 years on a total capital outlay not exceeding \$2,500,000. The third class of dry docks would have a length of 400 ft., an entrance width of 85 ft. and a minimum depth of 18 ft. The floating dry docks of this class would be

capable of accommodating vessels of a displacement of at least 3800 tons. The subsidy would be at the rate of 3 per cent. per annum for 20 years on a total capital outlay not exceeding \$500,000. Provision is also made for the extension of the new scale of subsidies to docks that may be graded up by enlargement from a lower to a higher class. The expenditure that would be authorized under this arrangement is very close to \$250,000 per annum.

A few days after the resolution was brought to the notice of the House it was announced that a company was organized to build two dry docks of the largest class, the work to be begun before the close of the year. One is to be built at Levis, opposite Quebec, on the St. Lawrence, and the other at St. John, New Brunswick. Both docks are to be fitted with the plant necessary for repairing vessels, and the St. John dock will, it is expected, have modern steel shipbuilding yards connected with it. Sir Robert Perks of McArthur, Perks & Co., England, arrived in Ottawa early in the week. He is a member of the new company. He says that Lord Perrie will represent Harland & Wolff on the company, Sir Thomas Shaughnessy the Canadian Pacific, and that other Canadians he names will be associated with them. Sir Robert says positively that a steel shipbuilding plant will be established by the company in connection with the St. John dry dock.

Industrial Notes.

The Hamilton Steel & Iron Company has decided to establish a steel rod mill. It recently had a test made of a couple of carloads of its pig iron to ascertain its suitability for the production of steel of the qualities necessary in material for screws and wire. The report made by the American testers appears to have been highly satisfactory.

A large number of foreigners employed at the works of the Hamilton Steel & Iron Company went on a strike last week, their demand being for higher wages. They returned to work on Saturday, upon the understanding that conditions in similar shops would be investigated and that they would be paid on what should be found to be the prevailing basis. Two of the officials of the company left to obtain the information in Buffalo and other steel making American cities.

The Provincial Steel Company at Cobourg, Ont., is rerolling about 5000 tons of steel rails for the Intercolonial Railway. The rails were purchased for the Intercolonial from the old Ship Railway Company, whose line ran from Fort Lawrence to Baie Verte. They originally weighed 110 lb. to the yard and are being reduced to 80 lb. The McKenna process is used.

The Mines Department of the Dominion proposes to establish at Ottawa an experimental plant to demonstrate the best method of concentrating ores of all kinds. It will be operated in connection with the Government's new peat plant. C. A. C. J.

Dearborn Drug & Chemical Works Staff Changes.

—Paul T. Payne, who has had charge of the Philadelphia office of the Dearborn Drug & Chemical Works, for the past two years, has returned to Chicago to do special work, out of the general offices. He has been connected with the company for the past 12 years, having spent a number of years in its laboratory before entering the sales department. Mr. Payne's assistant at Philadelphia, P. G. Jones, will assume the management of the Philadelphia office, covering eastern Pennsylvania, and W. J. Stokes, formerly with the H. W. Johns-Manville Company, will look after the company's interests in Maryland and Virginia with office at 809 American Building, Baltimore, Md. Both Mr. Jones and Mr. Stokes will work under the general supervision of the New York office of the Dearborn Drug & Chemical Works, at 299 Broadway, the headquarters of Grant W. Spear, vice-president and general Eastern manager.

The United States Patent Office Defended.

The Patent Law Association of Washington has issued the following statement under date of April 7:

In the *Washington Star* of March 29, 1910, Commissioner of Patents Moore is correctly credited with making the astonishing statement that 60 per cent. of the patents regularly issued by the Patent Office at the present time are "almost worthless, in whole or in part." He is also correctly credited with comparing the patent system of the United States with the patent systems of other countries, especially those of Great Britain and Germany, to the discredit of our system. These statements are of such a nature that they cast a cloud upon all patent property and are a serious reflection upon the personnel of the Patent Office. The statements throughout the article are of such a nature as to call for an answer from the patent lawyers of the country, as the members of the examining corps of the Patent Office are practically prohibited from making a reply. So long as these statements were made simply before a Congressional committee no attention was paid to them, but their widespread appearance in the daily press demands a prompt response.

At the outset, the question naturally occurs that if a majority of the patents issued weekly by the Patent Office are valueless, in whole or in part, whose fault is it? It cannot be said to be the fault of the inventors or of the attorneys who represent them before the Patent Office. Mr. Moore has been commissioner since June 1, 1907, and before that time was assistant commissioner from May 1, 1901, to June 1, 1907. The commissioner of patents has absolute authority to withhold any patent that does not comply with the requirements of the patent laws. Why, then, does he continue to issue worthless patents?

The commissioner's statement, however, is incapable of proof, and neither facts nor figures are given as a basis for it. The vast majority of patents are never litigated. Only a small fraction of 1 per cent. of them ever get into court, and of the patents litigated not over one-third are held to be void. It was stated at a recent hearing before the House Committee on Patents that of the patents litigated in the past four years (427), as reported in the *Federal Reporter*, only 29 per cent. were held to be invalid, in whole or in part, the number litigated being only a fraction of 1 per cent. of the patents issued during that time. Furthermore, every patent lawyer in active practice knows that a very large number of patents are acquiesced in every year without having their validity questioned, and is called upon to examine patents which his clients would like to have declared invalid, if possible, and upon such examination has been obliged to report that, in his opinion, the claims are valid.

As to the comparison of the patent system of the United States with those of other countries, we venture the opinion that our system is vastly superior to any and every other patent system in the world. This is generally acknowledged even in foreign countries, and, in fact, the present patent laws of Great Britain and Germany were modeled after the patent laws of the United States, and this is true to some extent of several other countries.

It may be admitted, perhaps, that there are some slight defects in the patent system of the United States, for perfection is difficult of attainment, but these defects are very minor ones.

In the same article, the commissioner stated that he had been "approached." It seems to us that under such circumstances it was his duty to promptly bring the fact before the grand jury, which action, in all probability, would effectually check any further attempts of this kind.

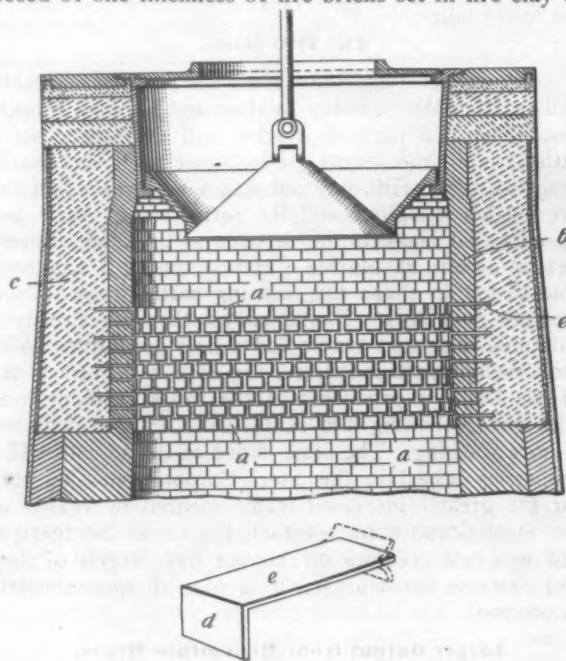
These statements were made by the Commissioner of Patents in an effort to have a law passed forming what is often called the Consolidated Board of Appeals,

including the commissioner, assistant commissioners and the examiners-in-chief.

Even if it be assumed that the commissioner's strictures on the present system are justified by the facts, it is not seen how the situation will be improved in the slightest by the legislation urged by him. He proposes to secure stability by means of an unstable board of appeals, to insure against invalid patents by an ever-changing tribunal of final resort in the Patent Office, and to effect uniformity of decision by a constantly shifting authority. His proposal, if adopted, would absolutely divest the Board of Examiners-in-Chief of that independence which its founders intended it to have.

Protection for Linings at Blast Furnace Tops.

A number of blast furnaces in eastern Pennsylvania are equipped with protecting plates on the upper portion of the lining after a patented method devised by Edward R. Cook, manager of the Warwick Iron & Steel Company, Pottstown, Pa. Mr. Cook conceived the idea of using steel plates of the form shown in the illustration, to prevent the wearing away of the lining which ordinarily results from the impact of stock as it is deflected from the bell against the inner walls of the furnace. Fig. 1 shows the arrangement of the plates *a* in parallel rows. The lining *b* from the lower line of this protection to the top of the furnace is composed of one thickness of fire bricks set in fire clay or



Figs. 1 and 2.—Steel Plates for the Protection of Blast Furnace Top Linings.

cement. The plates, which consist of a rectangular face, *c*, with an elongated projection, *d*, are mounted between the layers of fire brick and extend into the concrete backing. To give an additional anchorage, the projecting portions of the steel plates may be split at the ends, Fig. 2, and bent, as shown. A series of small plates, properly spaced, was decided upon so as to allow for expansion and contraction, or the twisting resulting from heat. Low carbon steel or cast iron absorb carbon from the furnace gases, and tend to swell and disintegrate, hence specially high carbon steel plates are employed.

This form of protection has been found, as tested in the past three years, to add materially to the life of linings. It is used at the three furnaces of the Warwick Iron & Steel Company, and one or more furnaces have been equipped with it by Richard Heckscher & Sons Company, Swedeland, Pa.; E. & G. Brooke Iron Company, Birdsboro, Pa.; Reading Iron Company, Reading, Pa.; Thomas Iron Company, Hokendauqua, Pa., and Wharton Steel Company, Wharton, N. J.

Western Mesaba Iron Mines.

Heavy Shipments from the Canisteo District— Old Range Operations.

DULUTH, MINN., April 9, 1910.—The Canisteo district, the western Mesaba range field which the Steel Corporation has been developing in the past several years, will be a heavy shipper this season. It will send out in excess of 1,500,000 tons, possibly in excess of 2,000,000 tons, and this after an expenditure of \$12,000,000. The bulk of the ore will come from the Canisteo, Hill-Walker, Holman and Hill properties. Much will be shipped directly from the mines to the docks, and the remainder will be treated at the Steel Corporation's mammoth concentrator or washer. Work on this concentrator is being pushed to the utmost, and it is expected that ores can be treated at the plant not later than June 1. Stripping operations have been extensive all winter, and large areas of ore have been added to those previously uncovered in the district.

One of the shippers this year will be the North Star at Taconite, which is a somewhat unique proposition, the mine being opened by means of a tunnel driven from the Holman open pit into the bowels of Mount Griffin, which is the second highest point of land in Minnesota. Much of the ore from the North Star is siliceous, and will have to be washed before going to the lower lakes.

The Hill Mine.

The earlier shipments from the western Mesaba will be from the Canisteo, Walker and Holman properties. The Hill mine at Marble will enter the lists a little later in the season. Developments have been in progress at the Hill only one and a half years, but the overburden is lighter and the formation of shale and taconite that blankets the deposits at the other properties is absent at Marble. Hence the Hill has been able to get in shape for shipping earlier than its immediate neighbors. The open pit there is already a half mile wide and a mile and a half in length. With the developments completed, the Hill will become one of the heaviest producers of the range, ranking well with the Mahoning and Hull-Rust. Its ore does not require washing. The mine is one of the so-called Hill properties leased to the Steel Corporation. To care for the greatly increased traffic insured by reason of the Steel Corporation contract, the Great Northern is adding a new ore dock on Allouez Bay, largely of steel and concrete construction, at a cost of approximately \$1,000,000.

Larger Output from Menominee Mines.

Corrigan, McKinney & Co.'s Tobin mine, Crystal Falls district, Menominee range, which in 1909 shipped 360,000 tons of ore, is prepared to send out an even larger production this year. The present main level of the Tobin—the tenth—is 1000 ft. below the surface. The eleventh level is being opened up, but will not go into full commission until a year hence. The tenth level is connected with the new shaft, sunk two years ago, by a rock tunnel, 350 ft. long, 22 ft. wide and 12 ft. high, affording ample room for the operation of the electrical tramping system by which all the ore is handled.

George H. St. Clair of Duluth has taken an option on the Noren property, in Section 9, 43-34, near Iron River, Menominee range, and is already testing the tract. He has two churn drills in commission.

The Steel Corporation has resumed operations at the Michigan mine at Amasa, Menominee range. The property had been idle for more than two years.

It is understood that the old Kloman mine at Republic, Marquette range, will be given another test. This property lies adjacent to the Republic mine of the Cambria Steel Company. It never was a large producer

and it has been out of commission a great many years. It is stated now that J. T. Gibson, a well-known mining man at Amasa, has taken an option on the Kloman, and will begin explorations there as soon as he can assemble his equipment.

The Cambria Company's Republic mine is an old property, as ages go among mines of the iron districts, having been opened in 1872. Its immense deposits of high grade hard ore made it a phenomenal success from the first, and in its second year it shipped over 100,000 tons. In 1880, for the first time, its output reached 200,000 tons, the Republic being the first mine in the entire region to attain that figure. The maximum production was in 1889, with an output of 287,500 tons. Since that time there has been a falling off and the annual shipments have not reached 200,000 tons since 1890. This curtailment is due to its ore being of unusually high quality, and it is desired to conserve the deposits, the bulk of the Cambria Steel Company's ore coming from the Penn group of mines on the Menominee range, and the Mahoning mine at Hibbing, Minn. The Republic has produced in excess of 6,100,000 tons in 36 years.

To Drain a Cascade Range Lake.

The Volunteer Ore Company, controlled by Thos. F. Cole of Duluth and associates, which some weeks ago started to sink a shaft in the Cascade district of the Marquette range, is preparing to drain Palmer Lake, on the shores of which the property is located. The water will be carried away by means of a ditch which is now being excavated. The Volunteer Company has located a large deposit of ore of much better grade than heretofore mined in the Cascade district, and its mine will be an important producer. The shaft is down upwards of 125 ft. The ore extends beneath Palmer Lake, and in time mining operations will be conducted directly under the basin now holding the water.

It is likely that it also will be found necessary to drain Runkle Lake, in the Crystal Falls district of the Menominee range. The Jones & Laughlin Steel Company is exploring in that locality and has found a deposit of ore, much of which lies under the bed of the lake.

Lackawanna Steel Company Earnings.

The Lackawanna Steel Company has made the following statement comparing its earnings in the first quarter of 1910 with those for the corresponding quarter in 1909:

	First quarter, 1910.	First quarter, 1909.
Income after deducting expenses, repairs, &c.....	\$1,087,091.34	\$178,670.25
Earnings on investments.....	329,000.00	80,460.44
Totals.....	\$1,416,091.34	\$259,130.69
Interest on bonds and notes.....	395,833.34	885,625.00
Balance.....	\$1,020,258.00	\$4126,494.31
Sinking funds.....	\$90,211.97	\$50,406.41
Depreciation and renewals.....	344,102.57	200,822.14
Total deduction.....	\$434,314.54	\$251,228.55
Surplus for quarter.....	\$585,943.46	\$377,722.50
Unfilled orders (gross tons).....	423,232	291,560
* Deficit.		

Sunday Freight Movement Stopped on Steel Corporation Roads.—A Pittsburgh dispatch says that the operation of freight trains on the Pittsburgh, Bessemer & Lake Erie Railroad was suspended on Sunday, April 10, and that the movement of ore, coal and coke and other materials on railroads controlled by the United States Steel Corporation will be suspended on Sunday hereafter. This order affects the ore roads in Minnesota as well as the lines in Ohio, Pennsylvania, Indiana and Illinois.

An Extreme Type of Trade Union.

An Employer's Statement as to Wire Weavers' Protective Association.

The Buchanan & Bolt Wire Company, Holyoke, Mass., manufacturer of Fourdrinier screens and other wire products, has issued a public statement in connection with a strike of its weavers, which sheds a side light on an extreme type of trade union, as follows:

"It was not the intention of the undersigned to make a formal statement in regard to our differences with the American Wire Weavers' Protective Association, but for the benefit of those of our employees who are still with us, as well as to justify those who may hereafter enter our employment, we think it only fair to make a statement of the case from our viewpoint.

"Ours has always been a union shop, and there has been no desire on the part of the management to have it otherwise, and if there are any privileges our weavers do not have, it is only because it has not occurred to them to ask for them, as any one who is familiar with conditions in our factory can testify. We are willing to pay the union scale of wages on our hand looms as long as we operate them, and so advised the committee who waited on us, but our power loom is an entirely new machine with some of the details not yet perfected, and we feel that it is unreasonable to ask us to accept a scale of wages without having an opportunity to determine the capacity of the loom under the management of skilled operators, and not any of the weavers who left our employ were competent to operate our power looms.

"The committee advised us, however, that the scale of wages had been indorsed by their Executive Board, and we must accept it or they would be obliged to go out on a strike, which they did before we had attempted to run any of the looms with outside help. They did state, however, that while our hand loom weavers were being taught to operate the power loom the scale could be at the rate of \$4 per day for eight hours' work, but when they were considered sufficiently competent the piece work scale submitted to us must be paid.

"The American Wire Weavers' Protective Association is all that the name implies, as any journeyman wire weaver coming here from a foreign country must pay into its treasury the sum of \$500 before he can join the union and be permitted to work in a union shop. We had two men in our employ since the strike was declared who had worked several years at the trade of wire weaving in Scotland, besides serving seven years' apprenticeship (only four years of apprenticeship is required in this country). One of these men applied for admission to the union and offered to pay \$100 of the fee at once, as that was all the money he possessed, and the balance in installments, but was advised that the whole amount must be paid before his application could be accepted. We know this to be a fact, as we were shown the letter from the executive board of the wire weavers' association to the applicant, and we ask a fair-minded public if an organized body of men are acting according to sound, American principles and for the best interests of organized labor in thus debarring an honest man from working at his chosen trade simply because he did not serve his apprenticeship in this country. These two men came to this country early last spring and had been unable to obtain employment as Fourdrinier wire weavers in a union shop for reasons above stated, but as soon as it became known to the union that they were in our employ, on hand looms, at union wages, they were induced to join the union free of charge and leave the employment they had been waiting 10 months to obtain."

Wellman-Seaver-Morgan Contracts.—An order for two horizontal turbine units, each 4200 hp., for the

Taylor's Falls Power Station, St. Croix Falls, Wis., has been placed with the Wellman-Seaver-Morgan Company, Cleveland, Ohio. This company will also build a turbine of 2260 hp. for the North Highlands plant of the Columbus Water Power Company, Columbus, Ga. It recently secured a contract from the Republic Iron & Steel Company for 12 Hughes gas producers of the standard type for installation at Youngstown, Ohio, and from the Pennsylvania Steel Company for one standard Hughes producer for installation at Steelton, Pa.

The Philadelphia Foundrymen's Association.

Important matters in connection with the foundry labor situation as well as the reading of an interesting paper on "The Microscope and Its Application to Metallurgy," by Wirt Tassin of the Duplex Metals Company, Chester, Pa., were responsible for a very large turnout of both local and out of the city members of the Philadelphia Foundrymen's Association at its regular monthly meeting, held at the Manufacturers' Club, on the evening of April 6.

After the transaction of routine business President Devlin introduced Mr. Tassin, who presented his study of segregation phenomena and heat treatment effects in connection with microscopic research on steel, copper and other metals. A large number of lantern slides were thrown on the screen, the various effects shown being described in detail by Mr. Tassin. Comparative results obtained by different methods in the treatment of the specimen under study were shown. The value of a uniform method, or at least a knowledge of the method, employed in preparing the specimen was considered necessary in order that comparative work may be of value. The paper was discussed by several members, led by Alexander E. Outerbridge, Jr., and C. C. Knight, after which a unanimous vote of thanks was tendered the author.

The labor situation in Philadelphia and vicinity, particularly the demand of the molders and core makers for an increase in wages, was discussed at some length. The jobbing and machinery molders and the core makers in nearly all the local foundries had a few days prior to the meeting demanded an advance in wages, varying from 10 to 18 per cent. That the movement was intended to be general in nature was evident from the fact that notices had been served on both open and closed shops. Molders ask for an advance from \$2.90 minimum to \$3.25 minimum per day; piece work molders an advance of about 10 per cent.; core makers an increase from \$2.75 minimum to \$3.25 minimum per day. A nine-hour day is also asked for. The principal reason given for the advance demanded was stated to be the increased cost of living. The day fixed by the employees on which the higher wage rates become effective is April 18. While the Philadelphia Foundrymen's Association takes no part in matters of this character, it was informally decided that a special meeting of employers of such labor would hold a meeting on the evening of April 11, at which some definite action would probably be taken. Following the meeting a luncheon was served in the club dining room.

An electric furnace of the Roehling-Rodenhauser type will be installed at the Delicias Works of Richard Honey, City of Mexico. It will have a capacity of 2500 kg. The steel plant in which it will be used is supplied with pig iron from the Encarnacion Iron Works in the State of Hidalgo, also operated by Richard Honey.

C. W. Leavitt & Co., ores, metals and alloys, have engaged a larger suite of offices on the eighteenth floor of the Cortlandt Building, Hudson Terminal, New York City.

PERSONAL.

The Harrisburg Foundry & Machine Works, Harrisburg, Pa., makes the following announcement: F. W. Jackson, formerly district manager at Baltimore, has been appointed manager for the Chicago District, with headquarters at Marquette Building, Chicago, Ill. He succeeds A. M. Morse, resigned, and will have associated with him Walter Bird, who continues as district engineer. C. H. Israel, formerly assistant engineer of the company at Harrisburg, has been appointed manager for the Baltimore District, with headquarters at 1415 Continental Trust Building, Baltimore. Geo. M. Illges, formerly district manager at Atlanta, Ga., has been appointed manager for the St. Louis District, with headquarters at 1415 Chemical Building, St. Louis, Mo. He succeeds Geo. D. Pogue, resigned, and will have associated with him P. A. Haradon, who continues as district engineer. R. B. Hall, Jr., has been appointed manager for the Atlanta District, with headquarters at Empire Building, Atlanta, Ga. Walter Castanedo has been appointed manager for the New Orleans District, with headquarters at 1103 Hennen Building, New Orleans, La. He succeeds Glenney & Castanedo and will have associated with him R. M. Doherty, who continues as district engineer. The company manufactures the Fleming Harrisburg engine.

President F. H. Caldwell of the Cahill Iron Works, Chattanooga, Tenn., has pardonable pride in the fact that his son, Frank W., who is a student in the Massachusetts Institute of Technology, carried away first honors in an airship competition at Waltham, Mass., April 3, winning a cup offered as a prize.

Henry D. Shute, whose appointment to the position of acting vice-president of the Westinghouse Electric & Mfg. Company was announced in *The Iron Age* last week, has been associated with the company for 17 years, and his promotions from time to time have been of a character to give him a broad experience in shop, sales and executive work. He was graduated in 1892 from the Massachusetts Institute of Technology. After a year's study in Germany at the School of Mines, Clausthal, and also in Dresden, he entered the works of the Westinghouse Company at Pittsburgh as an apprentice. In 1891 he was made the head of the alternating current division, correspondence department. Two years later he was advanced to the position of assistant to Vice-President L. A. Osborne, which position he held at the time of his recent appointment. In this latter position he was active in the developments made in heavy electric traction, and particularly in single phase railroad work.

O. H. Davidson, formerly president of the Davidson Foundry Company, East Chicago, Ind., and later with the Blair Engineering Company, Chicago, is now with the Calumet Engineering Works, Harvey, Ill., as superintendent of its foundry.

The Davenport Locomotive Works, builder of light locomotives, Davenport, Iowa, announces that A. L. Hageboeck, vice-president, in charge of commercial affairs, has also been placed in full charge of the sales department, vice A. E. Rosenthal, resigned.

The Wisconsin Engine Company, Corliss, Wis., has appointed Benjamin K. Hough Boston sales manager. He will have offices in the Oliver Building, Boston, and his territory will comprise the New England States.

J. A. Frantz has been appointed manager of the Technical Supply Company, with headquarters at Scranton, Pa. He supersedes Wm. P. Christopher, formerly sales manager.

The American Steel & Wire Company, through C. L. Miller, vice-president and general superintendent, announces appointments and transfers as follows: C. W. Lutz transferred from the Donora Works to take charge of construction of the Birmingham Works at

Birmingham, Ala.; F. D. Hayne transferred from the Rankin Works to the superintendency of the Donora wire department; J. G. Mustin transferred from Allentown and made superintendent of the Rankin Works; J. S. Phifer appointed superintendent of the Allentown Works.

The directors of the Alabama Consolidated Coal & Iron Company met in New York the past week and elected H. S. Matthews vice-president, with headquarters in Birmingham, Ala., and abolished the office of general manager, which was held by Guy R. Johnson. Mr. Matthews appointed C. P. Ludwig superintendent of transportation and in charge of mining and coke manufacture.

B. H. Chappell, who was formerly shop superintendent for a typewriter manufacturing company, has joined the Eastern sales department of the National-Acme Mfg. Company, Cleveland, Ohio.

Frank E. Hatch, Jr., who has been sales manager for the Auto Ideal Valve Company, New York, is now attached to the Eastern office of the National-Acme Mfg. Company, Cleveland, at 77 White street, New York.

C. J. H. Hillman, who has held a position in the Chicago office of the American Bridge Company, has been appointed contracting agent for the company at Minneapolis, Minn.

Richard D. Reed, who for many years has been with the H. B. Smith Company, Westfield, Mass., for a long time as sales manager, is soon to assume the active management of a large foundry, that is to be backed largely by Springfield capital. A sizable plant will be erected just as soon as a site is selected. There has been some talk of having the business located in Westfield, but the chances favor a location in Indian Orchard or Springfield.

The J. H. McLain Company, Canton, Ohio, at a recent meeting made George E. Downe president, and the statement is made that it is something like a home coming for Mr. Downe, he having been the president of the old National Hot Water Heating Company, and having arranged with the late J. H. McLain for the manufacture of the Spence hot water heaters. This is said to be in some measure responsible for the establishment of boiler manufacturing in Canton.

Copper Production and Stocks.

The official statement for March of the Copper Producers' Association, issued April 8, shows an increase April 1 in the stock of marketable copper in the United States of 16,636,882 lb., as compared with the stock March 1. The statement is as follows:

	Pounds.
Stock of marketable copper of all kinds on hand at all points in the United States March 1.....	107,187,902
Production of marketable copper in the United States from all domestic and foreign sources during March	120,067,467
Deliveries of marketable copper during March:	
For domestic consumption.....	62,844,818
For export.....	40,585,767

103,430,585
Stock of marketable copper of all kinds on hand at all points in the United States April 1.....

123,824,874
The March production was 7,354,974 lb. greater than that of April, while the deliveries for domestic consumption and export were 557,255 lb. less.

The Calumet Engineering Works, Harvey, Ill., has in process of construction the following crane orders: Hubbard Steel Foundry Company, East Chicago, Ind., one 35-ton, one 20-ton and two 10-ton; Mount Vernon Car Mfg. Company, Mount Vernon, Ill., three 10-ton; American Steel Foundries, Indiana Harbor, Ind., one 15-ton; International Harvester Company, Akron, Ohio, one 5-ton, one 6-ton and two 12-ton for the McCormick plant, Chicago.

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Business Good But Not Good Enough.

The record of pig iron production in the United State in the six months ending with March points to the largest activity the industry has known in any half year. Considering coke and anthracite pig iron, and leaving charcoal iron out of the account, our records show that between October 1, 1909, and March 31, 1910, inclusive, the production was 15,403,849 gross tons. The largest preceding output for six months ending with March was in the period beginning October 1, 1906, for which the total was 13,096,911 tons. That was regarded as a half year of remarkable activity, and it was. Yet the iron trade has apparently done nearly 18 per cent. more business in the past six months, and for half of that time, or practically since the beginning of the year, has been inclining to the view that conditions were considerably short of what they should be.

We cite the pig iron production figures, without taking account of the moderate accumulations of stocks in the past few months, as the best available measure of what the industry has done. They indicate that even though the buoyant markets of the fall of 1909 have been succeeded by much less spirited buying, and while the high hopes with which iron and steel manufacturers entered the new year have undergone some shrinkage in the past three months, there is still a momentum in the trade that promises much for the future. It is interesting to note that in the 90 days in January, February and March our production of coke and anthracite iron was at the rate of 84,679 tons a day, while in the 92 days between October 1 and December 31 it was at the rate of 84,595 tons a day—only 84 tons a day less. So continuous and even a run of high pressure production is as unusual as the rate of production itself. It represents a yearly rate of 31,333,000 tons of all kinds of pig iron, including charcoal. At more than 5,500,000 tons beyond the largest output for a calendar year, such a performance in from two to two and a half years after a panic is astonishing.

Yet the feeling abroad in the iron trade to-day suggests no such phenomenal performance. Expectations are so large a factor, and have been pitched so high that the actual facts fail to satisfy. The iron trade can only think of prosperity as meaning advancing prices, crowded order books, and mills falling farther behind orders with every week. It admits that business is

good, but says that it is not good enough. Not only are some things lacking, as just enumerated, that have marked the boom periods of other remarkable years, but the ability of some of our iron and steel works to do more than they are doing is apparent. The amount of slack is small; in some lines there is none; but the shadow of a greater mill capacity coming forward is well enough defined to cause concessions here and there. In pig iron every week makes it plainer that output must be cut down if the decline in prices is to be checked.

Three months of the new year are not sufficient to settle its character, but they have given some strong indications as to iron and steel consumption and the level of prices in 1910. These point to a record volume of business—what on any other year's capacity would probably have given a seller's market throughout the year—but at prices, particularly for pig iron, yielding only moderate profits to favored producers.

Further Jumbling of the Scrap Tariff.

The latest decision of United States general appraisers relative to the duty on iron and steel scrap, as reported elsewhere in this issue, adds a new tangle to those resulting from the scrap iron paragraph of the Payne-Aldrich tariff act. The contention of the Government in this case, which arose at Burlington, Vt., was that old axles and tires should pay the same duty as charged on new articles of the same form. This was overruled by the general appraisers, who held that worn out metal articles unfit for other than remanufacturing purposes are to be considered, in levying duties, as old scrap and not, for example, as axles or as tires. The general appraisers also held against the importer of the old axles and tires over which the issue was raised. He claimed that the \$1 a ton duty on scrap applied, but the general appraisers took the view that as paragraph 118 of the Tariff act of 1909 provides for scrap iron or scrap steel "fit only to be remanufactured by melting," old metal material fit to be remanufactured by other methods does not fall within the purview of that paragraph.

Having denied the contention of both the Government and the importer, the general appraisers searched for a provision in the Tariff act of 1909 to cover the case. Without fixing the duty, they raised the question whether old axles and tires, being waste or refuse material, because not in condition to be applied again to their former use, do not fall within the provision for "waste not specially provided for," paragraph 479, or for "junk, old," paragraph 600, Tariff act of 1909. As "waste not specially provided for" the old axles and tires would pay a duty of 10 per cent. ad valorem, which in the case in question would undoubtedly amount to more than the \$1 duty for iron and steel scrap, paragraph 118. As "junk, old," they would be admitted free of duty. Moreover, it would seem that a similar ruling would apply to old rails, where these are too much worn to be relaid, though still fit to be rolled into light shapes after heating.

The intention of the framers of the Tariff act of 1909 was plainly not to give old iron and steel that could be remanufactured by heating and hammering or rolling the benefit of the reduction from \$4 to \$1 a ton. Whereas, the Dingley act defined scrap as

"waste or refuse iron or steel fit only to be remanufactured," the Payne-Aldrich act, as indicated above, made a further restriction by adding the words "by melting," so as to limit the \$1 duty to material intended for the cupola, the crucible or the melting furnace. To admit old axles and tires free of duty is thus the irony of tariff blundering at its worst.

Steel products, like those involved in the Burlington importation, which become the raw material of a forge or a bar mill, come in direct competition with domestic steel billets, which, when valued between $\frac{3}{4}$ cent and 1.3 cent per pound, are protected by a duty of \$6.72. The sweeping away of that amount of protection against material imported with the definite purpose of remanufacturing it "without a complete change of form by fusion caused by the application of heat," is apparently in direct conflict with the Treasury Department decision of January 28, given to the Philadelphia Collector of Customs. Therefore, instead of the clearing up of the situation as further experience is had in applying the new tariff act to imported scrap, we have confusion worse confounded.

"Digging" in Industrial Plants.

The manager of a large plant remarked recently that he had been compelled to discharge two superintendents because they would not "dig." They attended to routine matters, but failed to make persistent effort to get at the root of things, with the idea of increasing production and eliminating waste. This is true of many shop managers. They lack in the assertive, inquiring nature, the effect of which is felt throughout the *personnel* of the establishment. Their daily observations are too superficial. They fail to concentrate their attention, first on this process and then on that; on one machine after another, always seeking for economies and improved product.

The right sort of man stimulates the energies of those under him. His aura, to use the phrase of the Eastern mystics, envelops all. Occasionally a man of this type is seen standing quietly for a considerable period, gazing at a machine, closely observing its operation and its product. Watch in hand, he times the work. He converts himself for the time being into a production engineer. He questions the operator and invites his suggestions. He calls the foreman in consultation. He studies costs with jealous care. The type is not a rarity. Every superintendent has some of this quality more or less well developed, or the limits of his value are narrow.

In handling men a superintendent should always be seeking the co-operation of the entire shop establishment. An excellent illustration of the lack of this was noted in an establishment which had been striving to perfect a process for manufacturing a certain article. Effort and experiment extending over a year had met with repeated failure. Another attempt was planned, using a different quality of steel, and the new superintendent asked the man who was to do the work what he thought about it. The artisan replied that he believed he knew how it could be accomplished, and he proved to be right. It developed that he had been in possession of the missing idea for months. Asked why he had not mentioned it, he said that he did not know how his advice would be taken. He had not been asked for an opinion. Such a condition is all wrong, of course.

The employee's confidence should be won, if possible. Judicious reward, at any rate open recognition of a service rendered, is the wise policy. Human nature responds to merited praise. A workman will go home proud and happy, with loyalty augmented and ambition stimulated, or he will experience some bitterness of mind because his ideas have been accepted, while he is no gainer even to the extent of thanks.

Some superintendents argue that it is easy to spoil a bright workman by praise, claiming that he gets an exaggerated idea of his own importance and value. This may be true in some cases, but with the general run of men the theory is to be doubted. A man should be criticised frankly for his errors, and praised with equal freedom for his successes, if they go beyond the routine expected of him. In either case, the influence extends beyond the individual. Fairness is keenly appreciated by the great majority of men.

Ill-Founded Machinery Criticisms.

Machinery builders and dealers are constantly annoyed, and often put to serious expense, by the peremptory and hasty complaints of purchasers that new machines are seriously at fault in their operation. In a large percentage of such cases the complaint is not well founded and would not have been entered if ordinarily careful investigation had been made. Usually the trouble arises where tools have been set up by the customers' own men. Machinery builders themselves are included in this class of critics. They are doing that of which they complain in others. There are the exaggerated cases, such as the presence of an oil can in a gear box. More often the cause is somewhat more obscure, though easily found if looked for conscientiously. The fact should be accepted in the beginning that the trouble may have arisen through the fault of the men who set up the machine rather than of its builder.

Two recent cases afford excellent illustrations. The purchaser of an engine lathe notified the dealer through whom he bought it that the carriage could not be made to work, that it could be brought only to a certain point where it would stop, and, the handle being released, would spring back as if forced up against a cushion. The dealer visited the shop and made an examination. Looking into the apron from below he saw wound around the leadscrew a bunch of cotton waste, forming a stop and cushion. The company's millwright who set up the tool had neglected to remove a bunch of waste which had filled an opening in the apron, placed there, as is the custom, to keep dust and cinders out of the mechanism during transit. The result was inevitable. The waste had wound tightly about the leadscrew. In the other instance the complaint was that an expensive, high-class engine lathe could not be made to bore true. The purchaser insisted that he himself had leveled up the machine after it had been set up in his shop, yet it bored so far from accurate as to be worthless for most purposes. The dealer went to the shop and put a level on the lathe, and the machine was proved to be well out of plumb. It had been set up skillfully and leveled true, but the foundation rested on sand, which had been displaced by the weight. The cause was remedied, and the lathe bored true to the builders' guarantee.

In these cases the dealer chanced to be available and knew his business. Had it been otherwise the manu-

facturer would have been compelled to send a man from the home shop, and the greater part of \$100 would have been spent, all because of a complaint which never should have been made. If the purchaser would take the same care to look into troubles with new equipment that he takes with his own product in seeing that it comes up to its specifications, there would be a large saving of money all round.

The "Free Port" Suggestion.

Much interest has been created by the resolution of the Massachusetts Legislature urging the passage by Congress of an act making Boston a "free port," an institution existing in Europe, but not yet established in this country. The proposition is to set aside a tract of land on Boston Harbor where manufacturers would establish plants, working up material received free of duty in this restricted area, and shipping finished products exclusively out of the country. In other words, the free port would accomplish that for which the drawback duties are intended. Opposition has developed to the plan, partly on account of expected rivalry between competitors, partly because a demand from other seaboard cities for similar privileges would immediately be made, following the granting of the right to Boston, and partly on the ground that the drawback system is adequate for this purpose. In answer to the last named objection the advocates of the plan argue that the drawback system is not wholly satisfactory in its operation.

The Iroquois Iron Company's New Blast Furnaces.

The Iroquois Iron Company, Chicago, has signed contracts for three turbine blowing engines for the two new blast furnaces now under construction. This is the first large installation of turbine blast furnace engines in the United States. The engines are in three units, the steam engine and turbine blower of each unit being mounted on the same shaft. The capacity of each unit is 40,000 cu. ft. per minute. The engines are of the Curtis horizontal condensing type and will be built at the Schenectady shops of the General Electric Company.

The boilers are of the Russ Babcock & Wilcox type of 7000 hp. capacity, using blast furnace gas. Hibben & Co., South Chicago, have been awarded the contract for the steel construction, amounting to about 3000 tons. The ore bridges and bins will be built by the Brown Hoisting Machinery Company, Cleveland, Ohio. The ore bridge conveyors will be of 7½ tons capacity.

Robert Fulton Memorial Water Gate.—A prize of \$3000 was awarded last week to H. Van Buren Magonigle, a New York architect, for the best design for the Robert Fulton Memorial Water Gate to be erected by the Robert Fulton Monument Association on Riverside drive, from 114th to 116th street, New York. The design provides for a great boat landing extending about 600 ft. into the Hudson River. It will be flanked by rows of colonnades, the tops of which will provide recreation piers. The water basin will be 350 ft. wide. A capacious central landing will bridge the New York Central Railroad track. On one side of this will be a building to be used for the exhibition of historical subjects connected with navigation. On the other side will be a building of similar design. A columnar peristyle will connect the two buildings. It is estimated that the water gate will cost \$3,000,000, of

which \$1,000,000 is expected from Congress, \$500,000 from New York State and most of the remainder from private contributions. Cornelius Vanderbilt is president of the Robert Fulton Monument Association.

Coke Rates to Buffalo.

Advices from Buffalo state that Judge Hazel of the United States Circuit Court has denied the motion made by the railroad companies to dismiss or suspend the injunction recently granted by that court restraining them from increasing the freight rate on coke coming into that city from the Connellsville region until the raising of the tariff rate should be passed upon by the Interstate Commerce Commission. The railroads gave notice at the time of the granting of the temporary injunction that the ruling would be appealed to the United States Court of Appeals, and the motion denied was for the dismissal of the injunction until the appeal has been decided. The railroad companies will be given a reasonable time in which to answer the complaint filed with the Interstate Commerce Commission by the Buffalo district furnace interests, after which the commission will set a date for a hearing.

The complaint filed with the commission alleges that the increased rate will be discriminatory against Buffalo steel makers in favor of steel makers in other localities, and if the proposed increase to \$1.85 per ton is placed in effect it will be "solely for the purpose of discrimination in favor of the Gary and Pittsburgh districts" as against Buffalo. The existing rate to Buffalo is set forth as 5 mills per ton mile, as compared with 4.6 mills per ton mile for the Gary district, a much longer haul. It further says that the increase in the rates will mean a burden to the Buffalo Steel interests of \$350,000 a year and involve a great loss on contracts under way, which were made on a basis of the present freight charge. The companies engaged in this struggle for the prestige of the Buffalo district are the Lackawanna Steel Company, Buffalo Union Furnace Company, Tonawanda Iron & Steel Company, New York State Steel Company and Wickwire Steel Company.

The American Sheet & Tin Plate Company.

In the month of March the American Sheet & Tin Plate Company broke all its previous records in sheet production by 2000 tons. This was accomplished without operating the Aetna-Standard Works at Bridgeport, Ohio, which is capable of producing about 12,000 tons a month. The company's galvanized sheet record was also broken by substantially 2000 tons, while new production records were made in five different tin mills, and an equal number of records were broken in various tin houses.

The American Sheet & Tin Plate Company has awarded contracts for its mill buildings at Gary, Ind., to the American Bridge Company, and in all probability in about 30 days the erection of the plate and jobbing mill building will be started. The contract for foundations has been placed with the Raymond Concrete Pile Company of New York and Chicago, and within the next 10 days it is likely that the contract for the two plate mills will be given out. Eventually the American Sheet & Tin Plate Company will have 140 sheet and tin mills at Gary, Ind., the first unit will be 22 mills, made up of two plate mills, four jobbing mills and 16 sheet mills, which will turn out upward of 20,000 gross tons of product per month.

The bulletin of the American Railway Association shows that on March 30 the net surplus of idle cars in the United States and Canada stood at 25,886, an increase of 8544 in two weeks.

The National Metal Trades Association.

Twelfth Annual Convention.

Nearly 200 members of the National Metal Trades Association were registered before the first session of the twelfth annual convention of the organization at the Hotel Astor, New York, was concluded, Wednesday morning. This is taken as an indication that the attendance at the two days' sessions of April 13 and 14 will be well attended, as many more members are due to arrive later in the day.

The meeting was opened this morning shortly after 10 o'clock, when John P. Mitchel, president of the Board of Aldermen of New York, made an address of welcome. He said that a glance at the convention programme and a survey of the subjects selected for discussion convinced him that the association was a "square deal" organization. The usual convention committees were appointed, after which the reports of President Howard P. Eells, Treasurer William Lodge and Commissioner Robert Wuest were read.

Extracts from the president's and commissioner's reports follow:

The President's Report.

It has not always been the custom of retiring presidents to make recommendations; but there are certain matters which appear to me to be of such consequence as affecting your progress and prosperity that I am disposed to present to this convention and to the new Administrative Council, as briefly as possible, certain things which in my judgment demand your favorable consideration and upon which early action is, in my judgment, desirable.

Some of these subjects will be extensively discussed in thoughtful papers to be presented by experts as a part of the deliberations of this convention. It is therefore unnecessary for me to do more than express my feeling that the important work, which been so well begun, for the promotion of co-operative industrial education, be pursued and pressed. I feel also that a definite programme on the subject of liability insurance should be adopted. We don't favor compulsory employer's liability insurance, because a compulsory system is paternalistic and undemocratic. In my opinion this association should work out a system of employer's liability insurance and urge our members to adopt it. I especially draw your attention to the practical plan which has been adopted by Deere & Co., which was so ably presented by Mr. Butterworth at the convention of the National Founders' Association.

During the past year the feeling has been growing upon me that a wider knowledge of the work, purposes and ideals of this association ought to be promoted. This can be accomplished in two ways: First, by drawing into our association more representative concerns in the metal trades and in affiliated lines, and by enlisting a more active interest in the work on the part of the men at the head of these concerns. In the second place, as a concrete recommendation, I urge the desirability of sending out, particularly to educators and to the educational institutions of the country, an accredited representative of this association, whose duty it shall be to advertise (I use this word advisedly) the National Metal Trades Association by explaining its aims and methods, thereby promoting incidentally the broad views which we are taking on the labor question and the work which we are doing for industrial education. The man engaged for this purpose should be an able man who will command attention. I need hardly say that, if we are to secure such a man, substantial inducements, pecuniary and otherwise, must be held out.

There is another recommendation, akin to the foregoing, which originated in the fertile brain of your commissioner, but which has not yet had the careful attention of your Administrative Council. I refer to what may be termed the establishment of an associate membership. Upon the supposition that the broadening of our work depends in large measure upon affiliating with our association important concerns employing large numbers of men, and that there are many such who are not disposed to join on account of the expense involved, it has been suggested that a plan be worked out whereby concerns in the metal trades employing 10,000 men or upward shall be allowed to avail themselves of associate membership by the annual payment of a nominal sum per operative, under an agreement that such associate membership shall not involve a charge upon our defense fund. Such a plan of associate membership would carry all the incidental benefits of full membership, including our moral assistance in time of trouble, the personal attention of our representatives, and the use of our labor bureaus and other facilities.

The Commissioner's Report.

In presenting my report for the past year, I wish to impress upon our members a few facts, with which I fear the majority are only casually acquainted.

First, we have achieved a splendid and enviable international reputation for standing absolutely for the "square deal."

Second, we have taken a most advanced position in demonstrating the advantage to all mankind in really promoting and fostering modern methods of technical education.

Third, we have at all times been doing all that can be done, consistent with justice and dignity, in preventing labor difficulties in the shops of our members.

In addition to the foregoing, and which I have not enumerated, we have in the past year demonstrated to capital and labor, to a greater degree than ever before, that we are alive to the advantage to capital and labor alike of providing modern and equitable methods of compensation for labor.

It must be gratifying to the members to know that their association is to-day in the best position in its history. But as has been pointed out, continued and increased loyalty is absolutely necessary to continued and increased success.

The past year has been rather uneventful in labor incidents, your officers having devoted more of their time to preventing rather than combating labor difficulties.

There is to-day a most decided feeling of unrest on the part of labor, organized and otherwise, and to the initiated it is apparent that an epidemic of strikes is in the air. One of the reasons for this feeling of unrest is the unwearying activity of labor leaders, and the most unfortunate publicity given their every doing in the daily press. Some day the advertisers, who, so I am told, are practically the support, or at least the greatest source of income to the daily press by reason of the vast sums spent for advertising, will insist upon "the cutting out" of this undue and deplorable prominence given labor leaders and other trouble makers, for the reason that "the public pays the freight," and every strike, no matter where called, affects ultimately the purchasing power of that dear public.

Labor leaders in the metal trades are more intense in their activities at this time than in recent years, and in my opinion, a great number of demands will be made during this year and the following.

It is unfortunate that as a class leaders of organized labor in the metal trades seem to be imbued with the spirit of selfishness, with the idea that the only way for them to secure some of the money accumulated by their organization is in promoting labor difficulties, instead of endeavoring to make the members of their organization more efficient, and thus secure for themselves the respect of their fellow citizens.

The routine business of the convention was dispatched so quickly that Dr. Frank B. Dyer, superintendent of Schools of Cincinnati, Ohio, who was due to talk on Cincinnati's continuation school on Thursday afternoon, was called upon to read his paper, and its conclusion brought the morning session to an end.

The Advisory Council of the association got together on Tuesday and had a session which lasted most of the day. At night the councillors and past officers held a dinner at the Hotel Astor.

On April 9, for the first time since the Payne Tariff act went into effect August 5, 1909, the net ordinary receipts of the United States Government showed a surplus over the net ordinary expenditures. It amounted to \$122,000, of which \$100,000 came from the new corporation tax.

The Buffalo Union Furnace Company, Buffalo, N. Y., has let a contract for a testing laboratory which it will add to its plant at the foot of Hamburg street on the Erie Railroad and Buffalo River; also for a two-story and basement office building, 40 x 40 ft., at 51 Hamburg street.

The National Steel Casting Company, Montpelier, Ind., is building a large addition to its foundry, the second addition in the last year. The wing is 56 x 140 ft., constructed of steel and brick. The entire length of the foundry, with this addition, will be 580 ft. The company is very busy and has difficulty in obtaining enough molders to keep up with orders.

Corrigan, McKinney & Co. to Build Another Blast Furnace.

Corrigan, McKinney & Co., Cleveland, Ohio, will build a new blast furnace at Josephine, Pa. It will have a daily capacity of 350 tons and will be practically a duplicate of the second furnace that the firm is building in Cleveland. The furnace will be built under the name of the Josephine Furnace & Coke Company, which operates the present Josephine stack. The new Cleveland and the new Josephine furnace will each be 20 x 85 ft.

Several contracts for construction work on both furnaces have been awarded and others will be closed shortly. The Babcock & Wilcox Company has been given the contract for the boilers for each furnace, each 3000 hp., in 500 hp. units of the Sterling type. The Sharon Boiler Works, Sharon, Pa., has been given the contract for the Josephine Furnace and the Variety Iron & Steel Works Company, Cleveland, the contract for the Cleveland Furnace. The American Bridge Company has been awarded the contract for the cast house, cinder, coke, ore and limestone bins, and the trestles for the Josephine Furnace. The McClintic-Marshall Construction Company has been given the contract for the cast house and bins for the Cleveland Furnace. The Hunkin-Conkey Construction Company, Cleveland, has the contract for the foundations and piling for the latter. It is planned to have both stacks ready to blow in the first of next year.

The Stassano Electric Furnace in Austria.

The following details are given by the *Iron and Coal Trades Review*, London, of the operation of the first Stassano furnace in Austria: The first electric furnace of the Stassano type to be erected in Austria is in operation at S. Pölten, where a second is in course of construction. The furnace is of 250 hp. and was tested, at the time of taking it over from the makers, with a charge containing about 15 per cent. tool steel scrap and 85 per cent. of mild scrap and nail points. In spite of the refractory character of the charge, the refining process was effected with a consumption of 1010 kw. hours per ton of molten charge. For a first attempt this may be regarded as satisfactory, and the figures have since been reduced to about 810 kw. hours. The results as regards the fining agree with those obtained in other plants of the same class, and although the metal is generally of low carbon content (frequently as little as 0.1 per cent.), sufficient heat is attained for pouring small and thin castings satisfactorily. The consumption of current is very uniform, the plant working parallel with the lighting and power circuit of the local municipality, from whose mains the supply is drawn, without giving rise to the slightest disturbance. A new feature in this plant is the periodicity of the polyphase current (25 periods per second), whereas the other furnaces already constructed work with a periodicity of 50. This change has not caused any inconvenience.

As an indication of the rapidly increasing use that is being made of the steam turbine, it is interesting to note that in one day the Allis-Chalmers Company, Milwaukee, Wis., received orders for six machines, as follows: Light, Heat & Power Corporation, Boston, Mass., a 1000-kw. for its North Adams plant and a 500-kw. for its Leominster plant; Manufacturers' Power Company, Woonsocket, R. I., a 1200-kw.; J. H. Ladew Company, Newark, N. J., two 300-kw.; and Kleeb Lumber Company, South Bend, Wash., one 500-kw.

At a meeting of directors of the Union Drawn Steel Company, whose No. 1 plant at Beaver Falls, Pa.,

was destroyed by fire last week, it was decided to rebuild as soon as the insurance is adjusted. In the meantime the company will run its No. 2 plant double turn and expects to take care of all orders promptly.

Trademark Protection.

Owners of trademarks have interest in the new field of protective service covered by the Trademark Title Company, Fort Wayne, Ind. This company was formed a few years ago to register, design and investigate the titles of trademarks, and now numbers its clients in every State in the union, besides a large foreign business. It is claimed by the company that the financial losses caused to manufacturers and jobbers owning valuable brands will be greatly lessened by this service, which will secure to its clients full rights under the trademark law and relieve them of great expense in litigation, that cannot be helped in any other way.

The Government in granting the registration of a trademark does not guarantee its validity. That is left to the courts. For this reason it is well for the applicant for a registration of a trademark to place the application in the hands of trademark experts and thus avoid as much as possible future trouble. As the Trademark Title Company has a more complete bureau of trademark records in this and foreign countries than is found in the Patent Office in Washington or in any other office in the world, a client is saved the expense of selecting a brand or mark and spending thousands of dollars to advertise it only to find that he must spend a great amount of money to establish its validity. The protective department informs its clients of any case of attempted registration of their marks and uses every effort to detect any infringements in this and foreign countries.

The Railroad and the Farmer.

Continuing its efforts to stimulate interest in scientific farming, the Pennsylvania Railroad has issued a pamphlet entitled "The Pennsylvania Railroad and the Farmer," which tells of the various things the railroad is doing to create traffic by co-operating with the farmer. The Pennsylvania Railroad began its agricultural campaign three years ago when it operated its first agricultural train. Since that time it has run educational trains and steamboats on practically all of its lines. It has distributed farming literature, established experimental farms and undertaken the education of its agents along agricultural lines.

In summing up the work the company is doing, the pamphlet above mentioned says: "What does it all mean to the railroad? It means there will be more fertilizers to haul, more farm implements, more raw material from which these tools are made, more crops to haul and more passengers to carry; it means that the railroad will be doing its duty to the public, to its stockholders in the intelligent exercise of its initiative, and, when reduced to a finality, that the railroad is performing its share of the work which must be done by the newly formed partnership, railroad and farmer, if agricultural communities are to progress and prosper."

The Phillips Sheet & Tin Plate Company is now operating practically full its new tin plate plant at Weirton, W. Va., and has placed a contract with the Nicola Building Company, Pittsburgh, for 100 additional dwelling houses. It is the intention of the concern to build homes for most of its employees in the new town of Weirton, which it has founded.

The Wharton Steel Company, Wharton, N. J., will blow out its No. 1 Furnace this week, leaving only one out of its group of three in blast.

OBITUARY.

EMORY V. DONELSON, Baltimore, Md., died suddenly April 5, on the way from his home to his office. He was the district representative of the Asbestos Protected Metal Company, Canton, Mass. He was well known in public life in Baltimore, having been electrical commissioner of that city for a number of years. Under his direction the new electrical apparatus was installed after the great conflagration in 1904. He leaves a widow and two daughters.

HENRY JOHNSON, a signal engineering expert, died April 7, in Rahway, N. J., aged 72 years. He was born in England and came to this country in 1886. He founded the Johnson Railroad Signal Company in 1888 and the Standard Signal Company in 1896. With his nephew, Charles R. Johnson, he was practically the first man to introduce scientific railroad signaling in this country.

JAMES HENRY BLESSING, who died in Albany, N. Y., February 21, was acting assistant engineer of the United States Navy during the Civil War, and Mayor of Albany in 1899. The return steam trap, which Mr. Blessing invented in 1870, was the best known of the 120 inventions with which he is credited. In 1872 he engaged with Gen. Frederick Townsend in the manufacture of the trap and other steam specialties, and a year later the firm of Townsend & Blessing became the Albany Steam Trap Company, with Mr. Blessing secretary and treasurer and general superintendent, and later president. He began life as an apprentice in the machinists' trade in 1853 at the age of 16 with the firm of F. & T. Townsend, which later became Townsend & Jackson.

GERHARD H. TIMMERMAN, president of the St. Louis Iron & Machine Works, St. Louis, Mo., died April 6, aged 85 years. He was born in Hanover, Germany, coming to America when he was 19 years old. He went to St. Louis 60 years ago and started a blacksmith shop, founding the Timmerman Iron Works in 1854, which was incorporated in 1875 as the St. Louis Iron & Machine Works. He leaves a widow, two sons and two daughters.

EUGENE STUART BRISTOL, president of the New Haven Mfg. Company, New Haven, Conn., died April 2, aged 67 years.

EDWARD WIEBENSON, Cleveland, Ohio, died from pneumonia April 1, aged 51 years. Born in Germany, he located in Cleveland in 1888, as a bank teller. At the time of his death he was president of the United Banking & Savings Company, vice-president of the Cleveland Pneumatic Tool Company, director in the Beckman Company, director of the Cleveland National Bank, treasurer of the Stark Electric Railroad Company, &c. He leaves four sons.

High Speed Machine Riveting.—The use of compression riveting machines has made it possible to drive a considerably greater number of rivets in the same amount of time than could formerly be done by hand. This is undoubtedly due to the fact that the machine drives the rivet by one squeeze and that the time is consumed, not in driving the rivet but in moving from one rivet to the next. According to the Chester B. Albee Iron Works Company, Allegheny, Pa., a record of 12,000 hot $\frac{3}{4}$ -in. rivets in 10 hours was recently established with a compression riveter. When it is considered that the best previous record was 10,000 rivets, and that for boiler work, where the joint must be steam tight and the rivets well driven, 1000 to 1500 rivets is considered good work, and on structural steel, such as girders, from 3000 to upward of 4000 is generally driven, and for irregular work,

such as trusses, the number probably falls as low as 2000 to 2500, the economy resulting from the use of a compression riveting machine is apparent.

The Berger Mfg. Company.

Notwithstanding that 1909 was by far the best year in reference to the amount of business ever enjoyed by the Berger Mfg. Company, Canton, Ohio, this year promises to be even better. During the first quarter it was naturally supposed that there would be a slight falling off as compared with 1909, owing to the extremely severe winter weather, which made outside work almost impossible; but in comparing the records the company reports with gratification that there is an increase in tonnage shipped, and the prospects for the balance of the year are very favorable.

The company is devoting a great deal of time to perfecting some of the minor details which influence a customer to favorably consider placing his business, such as prompt shipment, careful packing, prompt attention to inquiries and correspondence, &c. The great variety of products made by the company enables it to supply all the sheet metal wants of almost any customer and frequently to make advantageous combination shipments. Particular attention has been paid to the matter of stocks, several large modern warehouses having been recently completed, which will facilitate the proper care and the quick handling of sheet metal products.

The Pittsburgh Meeting of the American Electrochemical Society.

The seventeenth general meeting of the American Electrochemical Society will be held at Pittsburgh, May 5, 6 and 7. The professional and business sessions will be held at the Fort Pitt Hotel. On Wednesday afternoon, May 4, if a sufficient number of members is then present, a visit of inspection will be made to the technological testing plant of the United States Geological Survey. Sessions for the reading and discussion of papers will be held Thursday morning, May 5, Thursday evening and Saturday morning. The programme of excursions includes visits to the Park works of the Crucible Steel Works company of America, the Carnegie Steel Company's dry blast plant at Isabella furnaces, the Jones & Laughlin Steel Company's Talbot plant, the Fifth Sterling Company's works at Demmeler, where the Heroult electric steel furnace is in operation, and the Carnegie Steel Company's Homestead works, where a new type of combined open hearth and electric furnace is in operation. A dinner will be given at the Fort Pitt Hotel Friday evening and lunch at the Hotel Schenley Saturday at 1 p. m. A general public meeting has been planned for Saturday afternoon, at which there will be addresses, illustrated in part, on the present status of the electrochemical industries and on the conservation of power resources.

The Department of Agriculture has issued the first of its spring and summer reports on crop conditions, the feature of interest disclosed being the showing of damage to winter wheat. Recent reports of depreciation through drought are confirmed by condition of 80.8 on April 1, or a loss of exactly 15 points from the condition of 95.8 on December 1. This decline compares with a loss of 3.1 points in the same interval a year ago. The result is an indicated yield of but 13 bushels per acre, or about 2 bushels below the recent average. The extension of area planted, by about 3,500,000 acres, is the only factor making possible a respectable harvest indication, the estimated crop being 435,279,000 bushels, against 446,000,000 for 1909, and 437,000,000 for 1907.

THE IRON AND METAL MARKETS

Curtailment in Pig Iron.

Some Furnaces Go Out, but There Is No General Movement.

Curtailment of pig iron production is discussed as the thing most needed in that market. Several furnaces have gone out since the opening of the month and a few others are scheduled to stop soon. But some of these need relining, and thus far there are no signs of a blowing out movement that shall bring a better adjustment of production and consumption.

Some Southern furnaces have been selling rather freely at the low prices of the past two weeks, and have set a pace which Northern makers have not cared to follow. Northern furnaces with high costs have been crowded down to a point where profit disappears. Yet blowing out is not an easy alternative.

The leading cast iron pipe interest has inquired for 50,000 tons of Southern iron for delivery at its Southern works and has named figures which would carry the market to a new low level. Thus far \$12 at Birmingham for No. 2 foundry appears to be minimum, and a point at which the decline finds real resistance.

Buying by large foundry interests for the second half of the year has fallen off. What were bargains a month ago being now commonly quoted prices, the average buyer is not hurrying to cover.

Steel making pig iron is inactive in the Central West, and Eastern buyers of basic iron seem to have retired from the market, after taking a total of 40,000 tons for the third quarter in the past two weeks, some of these sales being made at \$17.50.

Foreign pig iron markets are weaker. Middlebrough warrants have declined from 51s. 4½d. to 50s. 10½d. the past week.

The weakening of steel billet prices is more pronounced. Some consumers find demand for their products slowing up, and in such cases billet shipments have been held back.

To what extent the decline in pig iron will affect finished materials is a question to which the steel trade is giving some attention. Little change is yet apparent in the conditions affecting rolled products. It is argued that prices for the latter have been for many months below the level of correspondence with steel making pig iron, and further that new rolling mill capacity has not yet developed to the point of aggressive competition.

Bars, sheets and tin plates are still banner products in activity. Certain agricultural machinery interests in the recent buying movement in bars closed for most of their requirements to July 1, 1911. In other cases deliveries run to the end of this year. The 1.40c. price appears to have been withdrawn, the leading mills being well sold beyond 1910.

Rail orders continue light, though inquiries for 20,000 tons have come up in the Chicago district. Steel car works are booked for from four to six months ahead, though just now there is a lull in car orders.

Structural steel markets are quieter. At Chicago the Hearst Building, 3600 tons, has been let, in addition to 3000 tons for the two new Iroquois blast furnaces. The latter are to have turbine blowing engines,

the first such installation in this country to follow that at Oxford, N. J.

The wire trade, while active, does not show the rush of demand that marked the spring of 1909. A steady movement more like that of 1908 is indicated.

Lake Superior ore shipments have started unusually early. There has been some talk of a readjustment of ore prices, but it has not been taken seriously. Producers of all grades apart from siliceous and high phosphorus ores are too well sold up. However, predictions of a 50,000,000-ton movement are less confident. In the East the cancellation of several round lots of Spanish ores is a factor, but under present conditions these shipments will not be seriously missed.

The copper market has been much more active in the past week under fresh declines in electrolytic, which sold at 12.87½c., and a sudden drop to 13c. for Lake.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

APR. 13, APR. 6, APR. 18, APR. 14, 1910. 1910. 1910. 1909.

PIG IRON, Per Gross Ton:

Foundry No. 2, standard, Philadelphia	\$17.75	\$18.00	\$18.00	\$16.25
Foundry No. 2, Southern, Cincinnati	15.25	15.75	16.25	14.25
Foundry No. 2, local, Chicago ..	17.50	18.00	18.25	16.50
Basic, delivered, eastern Pa.	17.50	17.75	18.50	15.00
Basic, Valley furnace	16.00	16.00	16.00	14.00
Bessemer, Pittsburgh	18.40	18.40	18.65	15.90
Gray forge, Pittsburgh	16.15	16.15	16.15	14.40
Lake Superior charcoal, Chicago ..	19.00	19.00	19.50	19.50

BILLETS, &c., Per Gross Ton:

Bessemer billets, Pittsburgh ..	27.00	27.00	27.50	23.00
Forging billets, Pittsburgh ..	32.00	32.00	32.00	25.00
Open hearth billets, Philadelphia	30.60	30.60	30.60	25.40
Wire rods, Pittsburgh	33.00	33.00	33.00	29.00
Steel rails, heavy, at mill	28.00	28.00	28.00	28.00

OLD MATERIAL, Per Gross Ton:

Steel rails, melting, Chicago ..	16.25	17.00	16.50	13.00
Steel rails, melting, Philadelphia	16.25	16.50	16.50	13.00
Iron rails, Chicago	18.50	18.50	19.00	16.00
Iron rails, Philadelphia	20.50	20.50	20.50	17.00
Car wheels, Chicago	16.50	17.00	17.00	14.50
Car wheels, Philadelphia	16.00	16.75	16.75	14.00
Heavy steel scrap, Pittsburgh ..	17.00	17.00	17.00	14.00
Heavy steel scrap, Chicago	14.50	14.75	15.00	12.25
Heavy steel scrap, Philadelphia ..	16.25	16.50	16.50	13.00

FINISHED IRON AND STEEL,

Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined iron bars, Philadelphia ..	1.50	1.55	1.57½	1.37
Common iron bars, Chicago ..	1.55	1.55	1.55	1.30
Common iron bars, Pittsburgh ..	1.60	1.65	1.65	1.30
Steel bars, tidewater, New York ..	1.61	1.61	1.61	1.31
Steel bars, Pittsburgh	1.45	1.45	1.45	1.15
Tank plates, tidewater, New York ..	1.71	1.71	1.71	1.46
Tank plates, Pittsburgh	1.55	1.55	1.55	1.30
Beams, tidewater, New York ..	1.66	1.66	1.66	1.46
Beams, Pittsburgh	1.50	1.50	1.50	1.30
Angles, tidewater, New York ..	1.66	1.66	1.66	1.46
Angles, Pittsburgh	1.50	1.50	1.50	1.30
Skelp, grooved steel, Pittsburgh ..	1.50	1.50	1.50	1.25
Skelp, sheared steel, Pittsburgh ..	1.60	1.60	1.60	1.35

SHEETS, NAILS AND WIRE,

Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	2.40	2.40	2.40	2.20
Wire nails, Pittsburgh	1.85	1.85	1.85	1.90
Cut nails, Pittsburgh	1.85	1.85	1.85	1.80
Barb wire, galv., Pittsburgh ..	2.15	2.15	2.15	2.35

METALS, Per Pound:

Cents.	Cents.	Cents.	Cents.
Lake copper, New York	13.00	13.75	13.75
Electrolytic copper, New York ..	12.87½	13.25	13.50
Spelter, New York	5.60	5.60	5.73
Spelter, St. Louis	5.45	5.45	5.58
Lead, New York	4.40	4.40	4.50
Lead, St. Louis	4.25	4.25	4.35
Tin, New York	32.45	32.90	31.70
Antimony, Hallett, New York ..	8.25	8.25	8.25
Nickel, New York	45.00	45.00	45.00
Tin plate, 100 lb., New York ..	\$3.84	\$3.84	\$3.84

* These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b. Pittsburgh.

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Structural Shapes.—I-beams and channels, 3 to 15 in., inclusive, 1.50c. to 1.55c., net; I-beams over 15 in., 1.65c., net; H-beams over 8 in., 1.75c.; angles, 3 to 6 in., inclusive, ¼ in. and up, 1.60c. net; angles over 6 in., 1.65c., net; angles, 3 x 3 in. and up, less than ¼ in., 1.75c., base, half extras, steel bar card; tees, 3 in. and up, 1.65c., net; tees, 3 in. and up, 1.60c., net; angles, channels and tees, under 3 in., 1.50c., base, plus 10c., half extras, steel bar card; deck beams and bulb angles, 1.80c., net; hand rail tees, 2.80c., net; checkered and corrugated plates, 2.80c., net.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.55c. to 1.60c., base. Following are stipulations prescribed by manufacturers, with extras to be added to base price (per pound) of plates:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼ in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 16.2 lb. per square foot are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼-in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16 in. take the price of 3-16 in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Gauges under ¼ in. to and including 3-16 in. on thinnest edge.....	\$0.10
Gauges under 3-16 in. to and including No. 8.....	.15
Gauges under No. 8 to and including No. 9.....	.25
Gauges under No. 9 to and including No. 10.....	.30
Gauges under No. 10 to and including No. 12.....	.40
Sketches (including all straight taper plates), 3 ft. and over in length.....	.10
Complete circles, 3 ft. diameter and over.....	.20
Roller and flange steel.....	.10
"A. B. M. A." and ordinary firebox steel.....	.20
Still bottom steel.....	.30
Marine steel.....	.40
Locomotive firebox steel.....	.50
Widths over 100 in. up to 110 in., inclusive.....	.05
Widths over 110 in. up to 115 in., inclusive.....	.10
Widths over 115 in. up to 120 in., inclusive.....	.15
Widths over 120 in. up to 125 in., inclusive.....	.25
Widths over 125 in. up to 130 in., inclusive.....	.50
Widths over 130 in.....	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive.....	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive.....	.50
Cutting to lengths or diameters under 1 ft.....	1.55
No charge for cutting rectangular plates to lengths 3 ft. and over.	

TERMS.—Net cash 30 days.

Sheets.—Minimum prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual advances for small lots from store, are as follows: Black annealed sheets, Nos. 3 to 8, 1.70c.; Nos. 9 and 10, 1.75c.; Nos. 11 and 12, 1.80c.; Nos. 13 and 14, 1.85c.; Nos. 15 and 16, 1.95c. Box annealed sheets, Nos. 17 and 21, 2.20c.; Nos. 22 to 24, 2.25c.; Nos. 25 and 26, 2.30c.; No. 27, 2.35c.; No. 28, 2.40c.; No. 29, 2.45c.; No. 30, 2.55c. Galvanized sheets, Nos. 13 and 14, 2.50c.; Nos. 15 and 16, 2.60c.; Nos. 17 to 21, 2.75c.; Nos. 22 to 24, 2.90c.; Nos. 25 and 26, 3.10c.; No. 27, 3.30c.; No. 28, 3.50c.; No. 29, 3.60c.; No. 30, 3.85c. Painted roofing sheets, No. 28, \$1.70 per square. Galvanized roofing sheets, No. 28, \$3 per square, for 2½-in. corrugations.

Wrought Pipe.—The following are the discounts on the Pittsburgh basing card on carloads of wrought pipe which went into effect January 1:

	Steel.	Black.	Galv.	Iron.	Black.	Galv.
¾ and 1 in.....	70	54	65	52		
1 in.....	71	57	66	52		
1½ in.....	74	62	69	57		
2 to 6 in.....	78	68	73	63		
7 to 12 in.....	72	57	67	52		
Plugged and Reamed.						
1 to 4 in.....	76	66	71	61		
Extra Strong, Plain Ends.						
¾ to 1 in.....	63	51	58	46		
1 to 4 in.....	70	58	65	53		
4½ to 5 in.....	66	54	61	49		
9, 10, 11 and 12 in.....	54	42	..	..
Double Extra Strong, Plain Ends.						
¾ to 8 in.....	59	48	54	43		

The above steel pipe discounts are for "card weight," subject to the usual variation of 5 per cent.

Boiler Tubes.—Discounts on lap welded steel and charcoal iron boiler tubes to jobbers in carloads are as follows:

	Steel.	Iron.
1 to 1½ in.....	40	43
1½ to 2 in.....	61	43
2 to 3 in.....	63	48
3 to 5 in.....	69	55
6 to 13 in.....	61	43
2½ in. and smaller, over 18 ft., 10 per cent. net extra.		
2½ in. and larger, over 22 ft., 10 per cent. net extra.		

Less than carloads to destinations east of the Mississippi River will be sold at delivered discount for carloads lowered by two points, for lengths 22 ft. and under; longer lengths, f.o.b. Pittsburgh.

Wire Rods.—Bessemer, open hearth and chain rods, \$33.

Steel Rivets.—Structural rivets, ¼ in. and larger, 2.15c., base; cone head boiler rivets, ¼ in. and larger, 2.25c., base; ¼ in. and 11-16 in. take an advance of 15c., and ½ in. and 9-16 in. take an advance of 50c.; in lengths shorter than 1 in. also take an advance of 50c. Terms are 30 days, net cash, f.o.b. mill. The above prices are absolutely minimum on contracts for large lots, makers charging the usual advances of \$2 to \$3 a ton to the small trade.

Pittsburgh.

PARK BUILDING, April 13, 1910.—(By Telegraph.)

Pig Iron.—There is some quiet buying of foundry, malleable Bessemer and basic pig iron in fair sized lots running through second quarter delivery and at relatively low prices. Bessemer is dull and the market is weak. Stocks of pig iron in the two valleys are heavy and a good deal of iron is pressing the market. On April 1 the Steel Corporation had 93 blast furnaces in operation and 13 idle, but it is probable that this month the corporation will blow out more, and the same action may also be taken soon by other interests. We note sales of 600 tons of malleable Bessemer to a local consumer at about \$16, Valley furnace; upward of 1500 tons of foundry on the basis of about \$16, at Valley furnace, for No. 2, and about 400 tons of basic for May and June shipment at a price reported to be a shade under \$16, at Valley furnace. We quote Bessemer iron at \$17.50; basic, \$16 to \$16.25; malleable Bessemer, \$16; No. 2 foundry, \$15.75 to \$16, and gray forge, \$15.25, all at Valley furnace, the freight rate for delivery in the Pittsburgh district being 90c. a ton.

Steel.—Some weakness in prices has developed in Bessemer steel billets and sheet and tin bars, a leading producer having come in the market recently and secured considerable business at prices lower than have ruled for some time. We note a sale of upward of 1500 tons of Bessemer sheet bars for forward delivery at a price equal to less than \$27.50, Pittsburgh. Whether this purchase could be duplicated today is doubtful, as this particular seller is now reported to be pretty well filled up. We note sales of about 300 tons of open hearth sheet bars at \$29, Pittsburgh, and about 500 tons of 4 x 4 in. open hearth billets at about \$28.50, Pittsburgh. We quote Bessemer 4 x 4 in. billets at \$27; Bessemer sheet bars, \$27.50 to \$28; 4 x 4 in. open hearth billets, \$28.50 to \$29; open hearth small billets, \$30 to \$30.50; open hearth sheet and tin bars, \$29 to \$29.50, and forging billets, \$32 to \$33, Pittsburgh.

(By Mail.)

The effects of the coal strike are being severely felt among the local mills, several being practically closed down. The coal operators and miners in the Pittsburgh district are now in conference, and it is hoped that a settlement will be reached. The opinion is general in the trade that the output of pig iron, steel, some finished products and coke is too great and that a radical remedy is needed to better the situation. The curtailment of pig iron production has already been discussed by blast furnace operators in the valleys and other nearby districts. There is nothing in the situation that indicates a betterment in the pig iron trade, and until this comes all other lines are bound to be adversely affected. There is little new demand for either basic or Bessemer iron, and prices are weak. Nominally the price of Bessemer iron is \$17.50 and basic \$16, Valley furnace, but if any large tonnage was wanted it is not unlikely these prices might be shaded. The market on Bessemer steel is weaker, Bessemer 4 x 4 in. billets being readily obtainable at \$27 or less, and Bessemer sheet bars have sold in the past week in fairly large lots, at a price equal to \$27.50, Pittsburgh. The new demand for steel seems to be almost entirely for open hearth, and the spread to-day between Bessemer and open hearth, in favor of the latter, is fully \$1.50 a ton or more, this being decidedly an unusual condition, and is due entirely to the fact that open hearth steel is scarce, while Bessemer is plentiful, with some pressure on the part of several outside mills to sell. In finished iron and steel the new demand is only fair, but specifications against contracts on such materials as plates, sheets, tin plate, steel bars and wire products are coming out very satisfactorily.

Ferromanganese.—A leading local steel interest is reported to be in the market for a very large tonnage for delivery over the last half. Prices are weak. We quote \$60 per cent. foreign at \$41 to \$41.50, Baltimore, the freight rate to Pittsburgh being \$1.95 a ton.

Ferrosilicon.—Inquiries are light. We quote 10 per cent. at \$23.90; 11 per cent., \$24.90; 12 per cent., \$25.90, and 50 per cent. at \$62, Pittsburgh, for forward shipment.

Muck Bar.—There are no new inquiries and prices are weak. We quote best grades at nominally \$29, Pittsburgh.

Rods.—Consumers are specifying fairly well against contracts, but the inquiries in the market are only for small lots for reasonably prompt shipment. While we quote Bessemer and open hearth rods at \$33, Pittsburgh, in small lots, for large lots for extended delivery a lower price could be made.

Skelp.—The dull condition of the pipe trade has caused a decided falling off in inquiries for skelp. For ordinary widths and gauges we quote grooved steel skelp at 1.50c. to 1.55c.; sheared steel skelp, 1.60c. to 1.65c.; grooved iron skelp, 1.80c., and sheared iron skelp, 1.90c., all f.o.b. mill, Pittsburgh.

Steel Rails.—The Carnegie Steel Company entered new orders last week for upward of 3000 tons of light rails. No contracts of moment for standard sections were placed, but the company is receiving good orders for export, and much of the business it now has on its books is of this class. The three Edgar Thomson rail mills are operating to about 50 per cent. of capacity, with several months' work ahead. Plans are in preparation for the new splice bar mill to be built at Edgar Thomson, but nothing else is contemplated there. We quote steel axles at 1.75c. to 1.80c. and splice bars, 1.50c., at mill, Pittsburgh. Light rail prices are as follows: 8 to 10 lb., \$32; 12 to 14 lb., \$29; 16, 20 and 25 lb., \$28; 30 and 35 lb., \$27.75, and 40 and 45 lb., \$27, Pittsburgh. These prices are for 250-ton lots and over, and for small lots premiums of 50c. per ton and more are being paid. We quote standard sections at \$28, at mill.

Plates.—While there was a decided falling off in car orders last week, inquiries are fairly active, and it is believed that within the next week or two some large orders will be placed. The two leading steel car companies are specifying for about 2500 tons of plates and shapes per day. The leading plate mills report they are well filled up for the next three months or longer, and the local market is fairly strong, but we note some weakness in prices among several of the Eastern mills. We quote 1/4-in. and heavier plates at 1.55c., Pittsburgh.

Structural Material.—No contracts of moment have been placed. The American Bridge Company has taken 2000 tons of bridge work for an Eastern road, and another local interest has taken about 900 tons for new steel buildings. Rolling capacity of the mills on plain material is not filled up, and prompt deliveries can be had. We quote beams and channels up to 15-in. at 1.50c., but in small lots, 1.55c. is still being quoted.

Sheets.—The demand is quite active, and prices are firmer than for some time. Demand is especially heavy for blue annealed and electrical sheets, and some consumers are still compelled to pay premiums of \$1 to \$2 a ton for reasonably prompt deliveries.

Tin Plate.—Some good sized contracts for third quarter delivery have been placed, and at the full regular price. We quote 100-lb. cokes at \$3.60 per base box, f.o.b. Pittsburgh, for delivery into third quarter of this year.

Bars.—All the leading steel bar mills are filled up for four months or longer and are therefore much behind in shipments. We quote steel bars at 1.45c. on contracts for delivery ahead, and 1.50c. on current orders for prompt shipment. A fair amount of business is being placed in iron bars, but these are not as active as steel. Prices are also weaker and we quote common iron bars at 1.60c. to 1.65c., f.o.b. Pittsburgh.

Hoops and Bands.—The demand is fair, and specifications against contracts are coming in at a satisfactory rate. We continue to quote steel hoops for forward delivery at 1.50c. to 1.60c., while for prompt shipment as high as 1.65c. is obtainable. Steel bands are 1.40c. to 1.50c. on contracts for forward delivery and 1.60c. to 1.65c. for reasonably prompt shipment, these carrying steel bar card extras.

Spelter.—The market is dull. We quote prime grades of Western at 5.40c., East St. Louis, or 5.52 1/2c., Pittsburgh. On a firm offer for a large lot it is probable that a lower price could be secured.

Spikes.—Two of the Western railroads are reported to have placed contracts for 6000 to 8000 kegs for delivery over the next three or four months. Local makers are fairly busy, but could take care of more orders. We quote standard sizes of railroad spikes, 4 1/2 x 9-16 in. and larger, at \$1.70 for Western shipment and \$1.75 for local trade. Boat spikes are firm at \$1.75, base, and small railroad spikes at \$1.75, base. These prices are for carload and larger lots.

Shafting.—Specifications against contracts continue to come in at a satisfactory rate, and new orders are also fairly active, but mostly for small lots. Discounts are 55 per cent. off in carloads and 50 per cent. in less than carloads.

Rivets.—The demand for boiler rivets is fairly active, but structural rivets are quieter. Makers state that speci-

fications against contracts are coming in at a fairly satisfactory rate.

Wire Products.—Specifications against contracts for wire products that were held up during the winter months, on account of severe weather and dull condition of trade, are now coming out more freely, as jobbers' stocks are moving at a good rate. We quote wire nails at \$1.85 in carload and larger lots; painted barb wire, \$1.85; galvanized, \$2.15; annealed fence wire, \$1.65; galvanized, \$1.95, and cut nails, \$1.85, all f.o.b. cars, Pittsburgh, usual terms, with full freight to destination added.

Merchant Pipe.—The Youngstown Sheet & Tube Company, Youngstown, Ohio, has two new butt weld furnaces practically ready for operation and the new No. 10 lap weld furnace, which will make pipe from 10 to 20 in., is practically ready. The lap weld mill will be in operation on or before May 1, and the butt weld mills as soon as the extra tonnage is needed. The Republic Iron & Steel Company has started up the butt weld department in its new tube mill near Youngstown, Ohio, in which sizes up to 2 1/2 in. will be rolled. The galvanizing department has also started, but the lap weld furnaces will not be ready for operation for some weeks. The Lorain, Ohio, plant of the National Tube Company, which shut down about two weeks ago, started up on Monday, except the butt weld furnaces, and these are expected to go on within the next few days. The demand for pipe is quiet. While the heavy stocks held by jobbers are moving out a little more freely, they are not yet ready to place new orders. In spite of the light demand, it is stated that discounts, printed elsewhere in this issue, are being well maintained.

Boiler Tubes.—The demand for locomotive tubes is showing some increase, but for merchant tubes is only fair. None of the mills has enough orders on its books to keep fully employed.

Coke.—The Jones & Laughlin Steel Company is reported to have completed the purchase of 20,000 to 22,000 tons of coke per month, deliveries running over the next three years, for its new blast furnaces at Aliquippa, Pa. This is the largest contract for coke that has come out in a long time. It is understood the entire contract was handled by a local dealer, who placed the tonnage with a number of different coke plants. It is said that on part of the purchase a flat price was made, while on the balance a sliding scale of prices prevails. A Wheeling blast furnace interest closed a contract recently for its supply of blast furnace coke for last half of the year, but details of the price paid are withheld. Reports are that about \$2 a ton at oven was the price, but some in the trade believe that \$1.90 was nearer the figure. Standard makes of furnace coke for prompt shipment can be had at \$1.75 per net ton at oven or less, while on contracts all the way from \$1.95 to \$2.15 per net ton at oven is quoted. These prices are for standard makes of blast furnace coke, running less than 1 per cent. in sulphur. Best makes of 72-hour foundry coke are held at \$2.60 to \$3 per net ton at oven.

Iron and Steel Scrap.—Inquiry is very light and the tone of the market is weak. Prices paid to the Baltimore & Ohio, Pennsylvania lines West and the Erie railroads, whose lists closed on April 6, were lower than for a good many months. Dealers quote about as follows, per gross ton, for delivery at Pittsburgh, or elsewhere, as noted:

Heavy steel scrap, Steubenville, Fol-	
iansbee, Monessen and Pittsburgh...	\$16.75 to \$17.00
Heavy steel scrap, Sharon, Pa., delivery	16.50 to 16.50
No. 1 foundry cast.....	16.00 to 16.25
No. 2 foundry cast.....	15.00 to 15.25
Bundled sheet scrap, at point of ship-	
ment.....	13.50 to 13.75
Rerolling rails, Newark and Cambridge,	
Ohio, and Cumberland, Md.....	17.50 to 17.75
No. 1 railroad malleable scrap.....	16.00 to 16.25
Grate bars.....	15.50 to 15.75
Low phosphorus melting stock.....	20.50 to 21.00
Iron car axles.....	26.50 to 27.00
Steel car axles.....	22.75 to 23.00
Locomotive axles.....	27.50 to 28.00
No. 1 busheling scrap.....	14.50 to 14.75
No. 2 busheling scrap.....	11.00 to 11.25
Old car wheels.....	15.50 to 15.75
Sheet bar crop ends.....	17.00 to 17.25
Cast iron borings.....	9.75 to 10.00
Machine shop turnings.....	11.75 to 12.00

The offices of the Jamison Coal & Coke Company, producer and shipper of coke, have been removed from the Frick Building Annex to rooms 1504-1510 Henry W. Oliver Building, Pittsburgh.

Eaton, Rhodes & Co. have taken quarters in the Henry W. Oliver Building, Pittsburgh, moving from the Commonwealth Building, with J. G. Walton in charge. They have been appointed exclusive selling agents in the Pittsburgh district of the Jackson County Iron & Steel Company, whose products are silvery and Bessemer ferrosilicon.

J. H. Hillman & Co., dealers in pig iron, coke, &c., have removed their offices to the Henry W. Oliver Building, Pittsburgh.

Chicago.

FISHER BUILDING, April 13, 1910.—(By Telegraph.)

The agricultural implement and bolt manufacturers are in the market for their requirements for their trade year beginning July 1, and some business has been done with them, although the mills are reluctant to contract any farther ahead than the last half of 1910. The bar mills have six months' business on their books now and a strong sentiment is growing among steel men against long term contracts. Current business in bars is unusually good, as concrete reinforcing business is becoming a very important factor in the trade, and the mills making bars from old steel rails are sold about as far ahead as they can afford to go. There is a good demand from Western bridge and fabricating shops for structural shapes, but many important projects are hanging fire and contracts may not be let for some weeks. The jobbing trade in wire products is carrying accumulated stocks into distribution in a very satisfactory manner. The railroads are still slow in buying, but their demands on the market are gathering headway and will become an important factor, as Western roads are making large appropriations for equipment and material. The usual spring congestion has appeared in the scrap market, as more material is coming in from the country and from railroads than dealers are able to dispose of, a condition which always brings lower prices. Cast scrap, moreover, is affected by the pig iron market, and the leading buyers of steel scrap already have large stocks. Consumers of metals are buying only for prompt shipment.

Pig Iron.—Another deadlock between sellers and buyers has resulted from the decline in prices. The Northern furnaces are selling in this market at \$17.50 to \$18 for the current quarter, but demand a higher price for the last half. The current business is confined almost entirely to small lots, and buyers are generally playing a waiting policy on their requirements for the last half. A considerable amount of malleable Bessemer business is pending for last half, but the local furnace interests are unwilling to meet the views of buyers and Ohio furnaces are not able to reach this market under present conditions. In Southern iron about the same situation prevails. Tentative inquiries which have been in the market for a long time would amount to a large tonnage of pending business if the buyers were anxious to close, but each inquiry has a string to it. One inquiry, which now amounts to 2800 tons, has made its appearance in the market three times in the past three months. There is some spot and resale iron to be had below \$12.50, Birmingham, but the furnaces continue to ask \$13 for last half for popular brands, and no contract business of any amount has been reported for the past week below \$12.50 in this market. The Southern furnaces claim that, owing to the advance in labor cost, their prices are now down near the cost of production, and in some cases agencies have been instructed not to incur telegraphic expense in submitting business offered below \$13 for last half. It is estimated that Southern stocks amount to about one month's production, with no material change in the past four or five months. Some furnaces have been piling iron recently, while others are carrying smaller stocks than last fall. The following quotations are for April, May and June shipment:

Lake Superior charcoal.....	\$19.00 to \$19.50
Northern coke foundry, No. 1.....	18.00 to 18.50
Northern coke foundry, No. 2.....	17.50 to 18.00
Northern coke foundry, No. 3.....	17.00 to 17.50
Northern Scotch, No. 1.....	18.50 to 19.00
Southern coke, No. 1.....	17.10 to 17.60
Southern coke, No. 2.....	16.85 to 17.35
Southern coke, No. 3.....	16.60 to 17.10
Southern coke, No. 4.....	16.35 to 16.85
Southern coke, No. 1 soft.....	17.10 to 17.60
Southern coke, No. 2 soft.....	16.85 to 17.35
Southern gray forge.....	16.10 to 16.60
Southern mottled.....	15.85 to 16.35
Malleable Bessemer.....	17.50 to 18.00
Standard Bessemer.....	19.90 to 20.40
Jackson Co. and Kentucky silvery, 6%.....	19.90 to 20.40
Jackson Co. and Kentucky silvery, 8%.....	20.90 to 21.40
Jackson Co. and Kentucky silvery, 10%.....	21.90 to 22.40

(By Mail.)

Billets.—While the local mills do not quote prices, consumers are having less difficulty than a few months ago in obtaining supplies from Eastern mills.

Rails and Track Supplies.—The local mills have taken no orders of any magnitude in recent weeks for standard rails, but there were inquiries in the market the past week from Western railroads for about 20,000 tons, this figure including some 4000 tons of traction rails. In some cases Western roads which placed orders last fall for 1910 delivery are now in the market with second orders, which the Chicago mills are not able to take. The demand for track supplies continues very good, but it is understood that Eastern mills are quoting lower prices on standard railroad spikes than Chicago mills will meet. We quote standard railroad spikes at 1.80c. to 1.90c., base; track bolts with square nuts, 2.40c. to 2.60c., base, all in carloads, Chicago. Light rails, 40 to 45 lb., \$27; 30 to 35 lb., \$27.75; 16, 20 and 25 lb., \$28; 12 lb., \$29, Chicago.

Structural Material.—Fabricating interests are not expecting any large aggregate of building tonnage during April.

Several projects of fair size are hanging fire in Chicago for one reason or another, and similar conditions are reported from other cities. There are very attractive projects in prospect which are not expected to reach the contract stage this month. The railroads are also slow in making contracts or specifying bridge work. The Hearst Building in Chicago, 3600 tons, was the principal contract of the week, but this was let in New York to the American Bridge Company. The Blackstone Theatre in Chicago, 345 tons, was let to the Joliet Bridge Company. The new plant of the Continental Bolt & Iron Company, Chicago, which calls for about 450 tons, was let to the Hansell-Elcock Company. The American Bridge Company has received specifications from the Atchison, Topeka & Santa Fe Railroad for about 300 tons of bridges. At Denver the general contract for the Central National Bank, which will require about 800 tons of fabricated material, was let to the Chicago office of the A. & S. Wilson Company. The Curtis factory building in Chicago, 700 tons, was let to Vierling, McDowell & Co., who will use Bethlehem shapes. The same contractors will erect the Callahan Building, 200 tons, using Bethlehem shapes. The structural material for Lincoln Hall at the University of Illinois, 500 tons, will be fabricated by the Decatur Bridge Company, which will use Bethlehem shapes. The mills report a very good demand the past week for plain material, principally from bridge companies. We quote plain material from mill, 1.73c. to 1.78c.; Chicago; from store, 2c., Chicago.

Plates.—A curious situation has developed in the plate market. The steel car builders have complained for some time that they have not been able to operate at full capacity because they could not obtain deliveries of material from mills, but there have been reports for some time that prices of plates were being shaded by Eastern mills. It is understood here that 1.50c., Pittsburgh, is the prevailing price on any attractive tonnage, although the local mills are not meeting this figure. The current demand for tank plates is good, and there are heavy specifications in prospect for steel car work. We quote mill prices at 1.68c. to 1.73c., Chicago; store prices, 2c., Chicago.

Sheets.—Jobbers are buying freely for their distributing trade and there is also a good demand from industrial buyers. We quote as follows, Chicago: No. 10 annealed, 1.93c.; No. 28 black, 2.58c.; No. 28 galvanized, 3.68c. Prices from store, Chicago, are: No. 10 blue annealed, 2.25c. to 2.35c.; No. 28 black, 2.90c. to 3c.; No. 28 galvanized, 4c. to 4.10c.

Bars.—The agricultural implement people and the bolt manufacturers are becoming interested in their requirements for their next trade year, beginning July 1. It has been their custom to cover their requirements by yearly contract with the mills, but this year they find that the mills are very reluctant to sell any further ahead than for the last half of 1910. Some business has already been done on that basis, and the mill men generally insist that they will not make yearly contracts under present conditions. The agricultural people do not begin selling their product until November, for delivery during the spring and winter of 1911, and sentiment in the steel industry is tending strongly in the direction of waiting until next fall before making prices for the first half of 1911. The opponents of long term contracts argue that the agricultural people will have all the data they require regarding cost of their material before they commit themselves on contracts with their customers, if they cover their requirements for next spring before their selling season begins in November. Last year the slump in the steel market came just in time for the agricultural people to take advantage of it in their yearly contracts, but many of the mills would only make contracts then to run until December, owing to the low prices at which the business was taken. Most of the agricultural people protected themselves by contracting until December for a sufficient tonnage to last them a year. Under these contracts the mills were swamped during the last three months of the year with specifications, and it will take most of them until July to work out these specifications received prior to January 1. In some quarters it is believed that if the mills refuse now to sell further ahead than December this condition will be repeated and that it might be better for the mills to continue the custom of annual contracts. In one or two cases it is understood that contracts for the full year have been made. In the case of the bolt manufacturers, it is not believed that the mills will be successful in restricting contracts at this time to the last half of 1910. The bar iron mills are not anxious to take business even for the full last half, owing to the fact that they buy their scrap in an open erratic market, which compels them to sell short when they make contracts running more than two or three months into the future. The hard steel bar mills, which are becoming quite a factor in the agricultural trade, have to take the same speculative risk when they sell for future delivery, as the cost of their material is controlled by the scrap market. It is understood in the Chicago market that the large contract buyers of soft steel bars are not able to obtain the concessions from open market prices which they have had in former years. Subject to the usual delay in delivery of soft steel bars, we quote as follows: Soft steel bars, 1.63c. to 1.68c.; bar iron.

1.55c. to 1.60c.; hard steel bars rolled from old rails, 1.55c. to 1.60c., all Chicago.

Rods and Wire.—There was a general feeling last winter that the jobbing trade was overstocked with wire products as the advancing market last fall had encouraged hardware dealers as well as jobbers to buy large stocks. The advance which had been scheduled for February was postponed and instead of higher prices there was some shading by the mills for March shipment. The distributing movement through the jobbing trade, however, has proved unusually large this spring and there are many indications that stocks are being digested. Jobbers are buying actively again and in the Northwest they are calling for all-rail shipment on business which had been given the mills for shipment by lake and rail after the opening of navigation. Industrial buyers are specifying freely on their contracts. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire, No. 9 and coarser, base, 1.83c.; wire nails, 2.03c.; painted barb wire, 2.03c.; galvanized, 2.33c., all Chicago.

Merchant Steel.—The agricultural implement people are figuring on their requirements for their trade year, beginning July 1, on seat springs, seats, harrow discs, plow steel and other special lines of steel of which they are large buyers. Some contracts have already been made in this market and there are many inquiries from buyers who have not yet covered their requirements.

Cast Iron Pipe.—No important lettings were reported in the West during the past week. The railroads, however, are active buyers of culvert pipe, most of the business coming in small orders, with specifications, instead of on general contracts. The jobbing demand is also good. The city of Evansville, Ind., is receiving bids this week on 1000 tons of water pipe.

Old Material.—The scrap market is generally lower this week, as material is coming in more freely from the country and buyers are indifferent. Some of the rolling mills have curtailed their operations on account of the shortage of coal, and this makes a slow market for all grades of material for rolling mill consumption. The pig iron market is weak and this affects the cast grades of scrap. Steel scrap is more plentiful, while the Chicago mills are carrying stocks that are large enough to cover their commitments and the scare of a year or two ago regarding a probable shortage of scrap for open hearth steel furnaces is wearing off. The market usually declines in March, when the movement from the country begins, but it was pointed out in this correspondence last month that the suspension of coal mining would keep cars in use for the storage of coal, which would delay until April the usual spring movement of country scrap. This view of the market has proved to be correct, and receipts from the country during this month promise to be large. The largest purchasers of scrap generally follow the market for finished materials, buying the tonnage required to cover their commitments. The rolling mills are now taking bar contracts for the last half of the year, and they will undoubtedly be more liberal buyers of scrap in the near future, but the course of prices will depend on the relation between their requirements and the shipments offered in the market. Following prices are per gross ton, delivered, Chicago:

Old iron rails.....	\$18.50 to \$19.00
Old steel rails, rerolling.....	17.75 to 18.25
Old steel rails, less than 3 ft.....	16.25 to 16.75
Relaying rails, standard sections, subject to inspection.....	24.00 to 25.00
Old car wheels.....	16.50 to 17.00
Heavy melting steel scrap.....	14.50 to 15.00
Frogs, switches and guards, cut apart.....	14.50 to 15.00
Shoveling steel.....	14.00 to 14.50

The following quotations are per net ton:

Iron angles and splice bars.....	\$16.50 to \$17.00
Iron car axles.....	21.50 to 22.00
Steel car axles.....	22.50 to 23.00
No. 1 railroad wrought.....	14.50 to 15.00
No. 2 railroad wrought.....	13.50 to 14.00
Springs, knuckles and couplers.....	13.75 to 14.25
Locomotive tires, smooth.....	18.50 to 19.00
No. 1 dealers' forge.....	12.00 to 12.50
Steel axle turnings.....	10.50 to 11.00
Machine shop turnings.....	9.50 to 10.00
Cast and mixed borings.....	6.25 to 6.75
No. 1 bushelling.....	12.00 to 12.50
No. 2 bushelling.....	9.50 to 10.00
No. 1 boilers, cut to sheets and rings.....	10.50 to 11.00
No. 1 cast scrap.....	13.75 to 14.25
Stove plate and light cast scrap.....	11.50 to 12.00
Railroad malleable.....	13.75 to 14.25
Agricultural malleable.....	12.00 to 12.50
Pipes and flues.....	10.75 to 11.25

Metals.—Buyers continue to confine their purchases to immediate requirements. The demand for shipment to-day or to-morrow is about normal, but there is little inclination among buyers to purchase copper or any other metal for future shipment. The softening tendency in the market encourages this feeling among consumers. Copper is quoted lower this week, and lead has also been reduced. The demand for old metals is quiet and prices are weaker, excepting for scrap tin. We quote Chicago prices as follows: Casting copper, 13½c.; lake, 13½c., in carloads, for prompt shipment; small lots, ¼c. to ¾c. higher; pig tin, car lots, 33½c.; small lots, 35c.; lead, desilverized, 4.40c. to 4.45c.,

for 50-ton lots; corroding, 4.65c. to 4.70c., for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 5.65c. to 5.70c.; Cookson's antimony, 10½c., and other grades, 9½c. to 10½c.; sheet zinc is \$7.75, f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote: Copper wire, crucible shapes, 13½c.; copper bottoms, 11½c.; copper clips, 13½c.; red brass, 12½c.; yellow brass, 10c.; light brass, 7c.; lead pipe, 4½c.; zinc, 5c.; pewter, No. 1, 24c.; tin foil, 26c.; block tin pipe, 30c.

Philadelphia.

PHILADELPHIA, PA., April 12, 1910.

Consumers show little interest in the market. Price concessions, which have been made in some grades of both pig iron and rolled products, do not seem to bring out any appreciable volume of business. Curtailment of production of pig iron is being considered in some directions, not so much because producers are carrying heavy stocks, but rather owing to the low level of prices, which in some instances are closely approximating costs. In finished products, plates, billets and sheets are probably the strongest, while lower quotations are to be noted for shapes and iron bars. Coke is weak, while old material prices have declined in some grades.

Pig Iron.—The largest sale reported was of 2000 tons of off grade iron to one of the Delaware River pipe foundries, for early shipment, at \$16, delivered. In the higher foundry grades transactions have been principally in small lots to cover immediate needs. As far as business of any size or for extended delivery is concerned buyers appear to have no interest in the market, even at prices under recent quotations. The higher range of quotations for No. 2 X foundry has practically disappeared, \$18.25, delivered in this territory, now being about the extreme top of the market. Reports are current that one producer, outside of this territory, has made offers considerably under the present market for deliveries in this vicinity. The minimum for Virginia 2 X appears to be \$18, delivered, although several sellers, who are pretty well sold up, make occasional sales of 25 to 50 cents more. There has been no movement in forge iron; sellers of the better known grades hold at about \$16.75 to \$17, although \$16.50 could no doubt be done for reasonably early deliveries. Pipe makers' ideas of prices for foundry forge range from \$16 to \$16.25, delivered. The basic iron movement seems to be at an end; the aggregate sold was about 40,000 tons, mostly for third quarter shipment, at \$17.75 to \$17.50, delivered. The latter price can still be done either for second or third quarter delivery, but buyers appear to have less interest in the market. A few small sales of misfit low phosphorus iron are reported, but no inquiry for standard grade has developed. Quotations named for second quarter delivery will in the majority of instances also apply on third quarter or even more extended delivery, but have not been generally so established. We quote as follows for second quarter delivery in buyers' yards in this vicinity:

Eastern Pennsylvania, No. 2 X foundry.....	\$17.75 to \$18.00
Eastern Pennsylvania, No. 2 plain.....	17.25 to 17.50
Virginia, No. 2 X foundry.....	18.00 to 18.50
Virginia, No. 2 plain.....	17.75 to 18.25
Gray forge.....	16.75 to 17.00
Basic.....	17.50 to 17.75
Standard low phosphorus.....	23.00 to 23.50

Ferromanganese.—Some little business in small lots is heard of, which fixes quotations at about \$41.50 to \$42, Baltimore.

Billets.—Makers report specifications as coming in very freely. Small orders for second quarter delivery have also been placed and producers have order books well filled. Prices for standard open hearth rolling billets are firm, at \$30.60, delivered in this territory, for second quarter shipment, while the same quotation has been made for moderate lots for third quarter shipment. A good demand for forging billets is reported, at prices ranging from \$32 to \$34, Eastern mill, dependent on specification and analysis. Ordinary miscellaneous open hearth billets are, however, still being offered for prompt delivery at a concession from the above quotations.

Plates.—While there have been no large individual contracts, the situation has a shade better appearance. Miscellaneous orders have been fairly good and in the aggregate are of about an average tonnage, but not up to the capacity of the mills. For this class of business mills get close to top prices, particularly as they can make good deliveries, for which prices range close to 1.75c., delivered in this district; in sharp competition or where delivery is not an important factor, 1.70c. is done.

Structural Material.—The demand continues to drag, although sellers appear willing to make lower prices for business of any size. In this territory the most recent project is the new office building for the Philadelphia & Reading Railway at Ninth and Spring Garden streets, which will require approximately 1000 tons. Several hotel propositions are also being figured on, while plans for a new hotel in Richmond, Va., are expected out in the near future. Current business

has been of a miscellaneous character. Prices continue weak, and while 1.70c., delivered, is generally quoted for ordinary business, 1.65c. can be readily done if any tonnage is concerned.

Sheets.—Mills in this territory continue to receive as much tonnage as they can comfortably take care of, and the situation continues strong. Prices are unchanged, the following range being named for near future deliveries: Nos. 18 to 20, 2.80c.; Nos. 22 to 24, 2.90c.; Nos. 25 and 26, 3c.; No. 27, 3.10c.; No. 28, 3.20c.

Bars.—The market has an easier appearance. The volume of orders coming out for refined iron bars is small and there is a disposition on the part of some producers to shade recent quotations for desirable specifications. In some instances 1.50c., delivered in this territory, has been done, although the leading producers hold pretty firmly at 1.60c. and even higher, dependent on the class of business offered. Steel bars are quoted at 1.60c. to 1.65c., delivered in this territory, but prompt deliveries are hard to get.

Coke.—Business continues largely of a prompt nature. A sale of 2500 tons of furnace coke, for early delivery, is reported at \$1.65 per net ton at oven. Foundry coke has been sold at prices ranging from \$2.50 to \$2.75, at oven. The market is still weak. For reasonable delivery in this district the following prices per net ton are quoted:

Connellsville furnace coke.....	\$3.90 to \$4.10
Foundry coke.....	4.75 to 5.25
Mountain furnace coke.....	3.50 to 3.70
Foundry coke.....	4.35 to 4.85

Old Material.—Easier conditions prevail and prices of some grades show a recession on small sales. Very little movement in heavy melting steel is noted, a few transactions between dealers representing the bulk of the business, although mills have been awarded some tonnage from the railroad lists. The price offered by the associated mills is 25 to 50 cents under the market. Eastern steel mills are reported to be taking deliveries more freely, which, however, apply largely on old contracts. Rolling mill grades are weak owing to better supplies and light demand. The following range of prices, while to some extent nominal, represents about the range of quotations for near future deliveries in this territory:

No. 1 steel scrap and crops.....	\$16.25 to \$16.75
Old steel rails, rerolling.....	17.50 to 18.00
Low phosphorus.....	21.50 to 22.00
Old steel axles.....	22.00 to 23.00
Old iron axles.....	28.00 to 28.50
Old iron rails.....	20.50 to 21.50
Old car wheels.....	16.00 to 16.50
No. 1 railroad wrought.....	18.75 to 19.25
Wrought iron pipe.....	16.00 to 16.50
No. 1 forge fire.....	14.00 to 14.50
No. 2 light iron.....	10.00 to 10.50
Wrought turnings.....	11.50 to 12.00
Cast borings.....	10.50 to 11.00
Machinery cast.....	16.00 to 16.50
Railroad malleable.....	16.00 to 16.50
Grate bars.....	13.25 to 13.75
Stove plate.....	12.00 to 12.50

H. K. Curtin & Co., Real Estate Trust Building, Philadelphia, have been appointed sales agents in that territory for the Zug Iron & Steel Company, Pittsburgh, Pa., for its high grade iron bars and iron and steel sheets, also for F. A. Godcharles, Milton, Pa., for cut nails and hinges, and for the Levering & Garrigues Company, New York, for fabricated structural steel.

Birmingham.

BIRMINGHAM, ALA., April 11, 1910.

Pig Iron.—Nothing occurred during the past week in pig iron circles tending to establish a firm base price. Quotations are still more or less irregular, ranging from \$12 to \$12.50, at the furnace. Some producing interests have sold some iron as low as \$12.50 for second and third quarters. All, however, seem to be asking a premium for fourth quarter business. Sales during the week were fairly good, the bulk being carload lots, but several 1000 and 2000 ton orders are recorded. None of the big buying interests has loomed up seriously as yet, and their action is awaited with eagerness, for it is considered that such will be the turning tide of a material buying movement. Stocks of iron on Southern yards are considerably more than producers consider comfortable, though, comparatively speaking, in normal times it would take but a very short while to work such an accumulation off. Inquiries are not brisk, being more or less of a straggling nature. A thorough canvass reveals the fact that furnacemen are not disposed to force sales; many of the important producing interests have called their salesmen in, preferring not to push matters under conditions now prevailing. While the demand for Southern charcoal iron is not considered brisk, sellers are asking from \$22 to \$22.50, at furnace.

Cast Iron Pipe.—The cast iron pipe plants of the district are running full, and all report sufficient orders in hand to guarantee continued operations for some time. A representative of one of the large interests here states that a hand-to-mouth business is likely to obtain until there is

some settled tone to the pig iron market. No large contracts are reported. Following prices, per net ton, f.o.b. cars here, are reported: 4 to 6-in., \$25; 8 to 12-in., \$24; over 12-in., average \$23, with \$1 a ton extra for gas pipe.

Old Material.—There is continued dullness in the scrap iron market, and quotations below represent a decline of 50c. to 75c. per ton from prices recently prevailing. Dealers have been busier buying and piling scrap on their yards than trying to force it on the unsettled and unsatisfactory market. Odd lots are being sold, but buyers apparently consider the market peculiarly theirs, and for that reason are inclined to take on further business only at reduced prices. We quote the following prices, per gross ton, f.o.b. cars here:

Old iron axles.....	\$18.50 to \$19.00
Old iron rails.....	14.50 to 15.00
Old steel axles.....	18.00 to 18.50
No. 1 railroad wrought.....	13.50 to 14.00
No. 2 railroad wrought.....	11.00 to 11.50
No. 1 country wrought.....	10.50 to 11.00
No. 2 country wrought.....	10.00 to 10.50
No. 1 machinery.....	12.00 to 12.50
No. 1 steel.....	11.00 to 11.50
Tram car wheels.....	11.50 to 12.00
Standard car wheels.....	13.50 to 14.00
Light cast and stove plate.....	9.00 to 9.50

Cincinnati

CINCINNATI, OHIO, April 13, 1910.

Favorable weather has stimulated business and more building projects are now coming out in this territory than for many months, which is having its effect on the finished material markets. Some good sized coke contracts are in negotiation, but the scrap market still shows great weakness.

Pig Iron.—All sales agencies agree that delivery and price possibilities are more clearly defined. It is not so clear that business has assumed greater proportions thereby, although if the largest pipe interest takes the quantity of iron for which it is inquiring the April volume of business thus far will compare favorably with preceding years. Expecting to buy 40,000 tons of low grades on a basis of \$10.50 to \$11, Birmingham, for forge, it is confidently asserted by leading agents here that the pipe interest will pay not less than \$11.25, and will probably have to go a little higher if the maximum quantity is secured. Although not often quoted nor announced, it is stated that there is a little accumulation of low grades in the Northern districts which will enter into competition for the pipe business with Southern producers. Another inquiry for foundry iron comes from a prominent central Ohio car manufacturing concern, which would buy 1000 to 1500 tons of low grades to take the place of scrap for second and third quarters. A manufacturer of clay working machinery in northern Ohio is negotiating for 1500 tons of No. 2 foundry for last half and will take Northern iron. There is an inquiry from a Michigan stove maker for 1500 tons for the last half. On Southern irons there is a greater spread in the price of No. 2 than for many weeks, but manifested entirely in prompt and early delivery iron. While it is possible to buy a No. 2 Southern foundry iron at \$12, Birmingham, for delivery up to July 1, there are other Southern irons for which \$13 is asked and secured. One large Southern producer will accept \$12.50, Birmingham, for shipment up to August 1, but is unwilling to quote beyond that date. Northern irons are unchanged for forward delivery, but \$16 for No. 2 is shaded 25c. for April and, possibly, May delivery. Reports on Jackson County silveries indicate that considerably better than the officially authorized price can be done. Some little business is going in malleable at the established price of \$16, southern Ohio. A Chattanooga concern is buying 500 or 600 tons. Basic is also quotable at \$16 to \$16.50 for 1910 delivery. Foundrymen report the melt increasing. For immediate delivery and up to July 1, based on freight rates of \$3.25 from Birmingham and \$1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry.....	\$15.75 to \$16.25
Southern coke, No. 2 foundry.....	15.25 to 15.75
Southern coke, No. 3 foundry.....	14.75 to 15.25
Southern coke, No. 4 foundry.....	14.50 to 14.75
Southern coke, No. 1 soft.....	15.75 to 16.25
Southern coke, No. 2 soft.....	15.25 to 15.75
Southern gray forge.....	14.25 to 14.50
Ohio silvery, 9 per cent. silicon.....	19.70 to 20.20
Lake Superior coke, No. 1.....	17.45 to 17.70
Lake Superior coke, No. 2.....	16.95 to 17.20
Lake Superior coke, No. 3.....	16.45 to 16.70
Standard Southern car wheel.....	25.25 to 25.75
Lake Superior car wheel.....	22.25 to 22.75

(By Mail.)

Coke.—Connellsville spot furnace grades are selling at \$1.75 to \$2 per net ton at oven, and for forward delivery \$2.25 to \$2.50; Connellsville foundry, \$2.25 to \$3 for spot and \$2.50 to \$3 for extended deliveries. Wise County furnace grades are quotable at \$1.65 to \$1.85 for spot, and contracting is done on a sliding scale basis. Pocahtontas furnace is bringing \$2.25 to \$2.50 on contract and \$2 is about

the minimum for immediate delivery. Pocahontas foundry grades are bringing \$2.50 to \$2.75 spot and contract.

Finished Material.—Business in finished lines is excellent. Sheets are especially strong, one large interest in this district reporting the week's business considerably in excess of the opening week of April. Open fair weather has stimulated buying of all kinds of building sheets and twisted steel bars for concrete work. Deliveries on sheets are running now between four and five weeks. Premiums are still paid for prompt delivery. The Engineering Company, Fort Wayne, Ind., will furnish the steel, 700 tons, for the office and shop to be erected by the Fort Wayne Electric Company. Warehousing is reported excellent by all dealers.

Old Material.—Transactions are few and far between. Offerings of railroads are taken by dealers, but at low figures. Dealers who venture an opinion on the market say that it is very weak, with prices sagging, and that relief is not yet in sight. For delivery in buyers' yards, Cincinnati and southern Ohio, we quote nominal prices as follows:

No. 1 railroad wrought, net ton.....	\$12.75 to \$13.00
Cast borings, net ton.....	7.00 to 7.50
Heavy melting steel scrap, gross ton...	13.50 to 14.00
Steel turnings, net ton.....	9.00 to 9.50
No. 1 cast scrap, net ton.....	12.50 to 13.00
Burnt scrap, net ton.....	9.00 to 10.00
Old iron axles, net ton.....	18.00 to 18.50
Old iron rails, gross ton.....	17.50 to 18.00
Old steel rails, short, gross ton.....	15.00 to 15.50
Old steel rails, long, gross ton.....	16.00 to 16.50
Relaying rails, 56 lb. and up, gross ton...	23.00 to 24.00
Old car wheels, gross ton.....	14.00 to 14.50
Low phosphorus scrap, gross ton.....	17.00 to 17.50

Cleveland.

CLEVELAND, OHIO, April 12, 1910.

Iron Ore.—The first ore cargo this season left Ashland April 11 for Lake Erie. This is an early opening of navigation. Last year the first ore cargo was received after May 1. Many of the ore carriers will start out April 16, when vessel insurance becomes effective. Several of the boats of the Pittsburgh Steamship Company will start out within the next week, going into commission a little earlier than last year. The Canadian lock at the Soo has been opened, but no date has been set for the opening of the American locks. The ore market continues dull, with an occasional sale of a small tonnage reported. We quote prices as follows: Old Range Bessemer, \$5; Mesaba Bessemer, \$4.75; Old Range non-Bessemer, \$4.20; Mesaba non-Bessemer, \$4.

Pig Iron.—The present low quotations are bringing out but few inquiries. A local manufacturer has asked for 1300 tons of No. 2 foundry for the last half, on which quotations have been made of about \$16.50, delivered, but is holding off in the hope of getting a somewhat lower quotation. The same concern is in the market for the same tonnage of malleable. The only other inquiry of any size pending is from a northern Ohio manufacturer for 2000 tons of foundry iron for the last half. No. 2 foundry is quoted at \$15.75 to \$16, Valley furnace, but this price could probably be shaded to \$15.50 for spot shipment and second quarter delivery. Several of the northern Ohio producers are holding firmly to \$16, at furnace, for No. 2, and announce that they will make no effort to make sales until they can get that price. Local furnaces continue to quote No. 2 foundry for Cleveland delivery at \$16.75, delivered, for the second quarter and \$17.25 for the last half. No. 1 stack of the Cleveland Furnace Company was blown out April 1. This furnace will be relined. For spot shipment and second quarter we quote, delivered, Cleveland, as follows:

Bessemer.....	\$18.40
Northern foundry, No. 1.....	\$16.75 to 17.00
Northern foundry, No. 2.....	16.40 to 16.75
Northern foundry, No. 3.....	16.15 to 16.40
Gray forge.....	16.15
Southern foundry, No. 2.....	16.85 to 17.35
Jackson Co. silvery, 8 per cent. siliceous.....	21.05 to 21.55

Coke.—Small lots of foundry coke are being sold for early shipment, but foundries are not contracting for the last half. We quote Connellsville furnace coke at \$1.85 to \$2 per net ton, at oven, for spot shipment, and \$2.15 to \$2.30 on contract. Connellsville 72-hr. foundry coke is held at \$2.50 to \$2.75 for prompt shipment and \$2.75 to \$3 on contract.

Finished Iron and Steel.—The most important feature in the market this week is the improvement in the structural situation. In other finished products specifications are holding up well and there is a fair volume of new business. In steel bars some additional contracts have been placed by implement makers on the basis of 1.45c., Pittsburgh, for specifications until October 1. There is a fair demand for plates in small lots for early delivery. Plates are now plentiful for prompt shipment. Mills are eager for business and in some cases prices are being shaded to 1.50c., Pittsburgh. Contracts for structural material closed during the week include 2000 tons to the American Bridge Company for bins, trestles and other work in connection with a new blast furnace to be erected by Corrigan, McKinney & Co. at Josephine, Pa., and 1000 tons to the McClintic-Marshall Con-

struction Company for similar work for the same firm in Cleveland. Inquiries for structural material for bridge work, aggregating several thousand tons, have been received from the Michigan Central, Lake Erie & Pittsburgh, Lake Erie & Western and Wheeling & Lake Erie railroads. An addition to the plant of the Warner & Swasey Company, Cleveland, will require about 600 tons. Considerable structural work is expected to be placed in Detroit soon for additions to automobile and other plants. The demand for sheets is fair. Good deliveries can now be secured except on blue annealed sheets, and prices on black and galvanized sheets are being shaded \$1 a ton. The demand for iron bars is fairly active. Prices are steady at 1.45c. to 1.50c., Cleveland. Orders for twisted steel bars for reinforced concrete work have become quite heavy. Mills can make fairly good deliveries. Several inquiries are pending for steel piling. The demand for forging billets in carload lots for quick delivery is good, and orders are still being taken at \$32, Eastern mill, for prompt shipment. Jobbers report a good volume of stock orders for steel bars and a fair volume of business in other finished lines.

Old Material.—After holding fairly steady for several weeks, the continued absence of a demand has resulted in a further weakening of prices. Quotations on heavy melting steel have been marked down 25 cents a ton, and a similar reduction has been made on borings. Other quotations remain unchanged, although absence of transactions makes quotations largely nominal, and dealers express considerable uncertainty regarding prices. The Lake Shore & Michigan Southern Railroad will close on a large scrap list April 14. Prices per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails.....	\$15.50 to \$16.00
Old iron rails.....	17.50 to 18.00
Steel car axles.....	22.00 to 22.50
Heavy melting steel.....	14.75 to 15.00
Old car wheels.....	16.00 to 16.50
Relaying rails, 50 lb. and over.....	22.50 to 23.50
Agricultural malleable.....	14.00 to 14.50
Railroad malleable.....	15.50 to 16.00
Light bundled sheet scrap.....	10.50 to 11.00

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles.....	\$21.50 to \$22.00
Cast borings.....	8.00 to 8.25
Iron and steel turnings and drillings.....	9.00 to 9.50
Steel axle turnings.....	11.00 to 11.50
No. 1 busheling.....	13.00 to 13.50
No. 1 railroad wrought.....	15.00 to 15.50
No. 1 cast.....	14.00 to 14.50
Stove plate.....	12.00 to 12.50
Bundled tin scrap.....	11.00 to 11.50

St. Louis.

ST. LOUIS, April 11, 1910.

St. Louis manufacturers of iron and steel are well pleased with the outlook. There is an especially good demand for forgings, bolts and all kinds of structural and architectural iron. The leading local car and foundry company, the large local steel castings foundry and the car wheel manufacturers are running full. The large steel works and iron foundries at East St. Louis are also well supplied with contracts requiring several months to fill.

Coke.—Sales agencies report a quiet market, with some irregularity in prices. About the only encouraging feature consists in specifications coming quite freely for contract coke. One house reports an inquiry for 8 to 10 carloads, and most offices are receiving inquiries for small lots and are making some sales of moderate size. There is still an inquiry for a round lot pending. Standard brands of 72-hr. Connellsville foundry are offered by some of the brokers at \$2.30 per net ton, f.o.b. oven, for prompt shipment, and at \$2.50 for scattered shipment to January or April, 1911.

Pig Iron.—While there has not been so much inquiry nor so many contracts closed as the previous week, interest in the market continues to be manifested and some round lots have been booked. There is more doing in basic and malleable than in Southern foundry. Among the sales reported are the following: To a local steel foundry, 5,000 tons of Missouri low phosphorus basic; 2000 tons of malleable iron for shipment over the last half; 1000 tons of malleable and 1000 tons of Lake Superior charcoal for shipment over the second quarter; 400 and 300 tons of Southern foundry for shipment over the last half, and 150 tons for shipment over the third quarter. A number of large consumers in St. Louis territory have not contracted for supplies of iron for the last half to any extent, and these buyers are likely to come into the market quite generally at the first indication of the firming of values. There continues to be some variation in the views of furnacemen respecting prices, especially for deferred shipment, and it is believed that some of the smaller ones will drop out of the running (now that prices have declined out of proportion to the cost of production) until conditions become more favorable. Resale iron is still on the market at a concession below furnace figures. We quote No. 2 Southern foundry for shipment over the remainder of the year at \$12.50, with some furnaces still holding at \$13 for this delivery, f.o.b. Birmingham. Southern Ohio is quoted at \$16 to \$16.50, f.o.b. furnace.

Lead, Spelter, &c.—Lead is dull and quoted at 4.25c; spelter is quiet and held at 5.47½c, f.o.b. East St. Louis. Zinc ore is steady at \$41 per ton; Joplin, base. Tin is 32½c per 100 lb. lower; antimony ½c. off all round; copper is unchanged from last week. The demand for finished metals was moderate for the first half and good for the last half of the past week.

Old Material.—Dealers report a very dull market, with business almost wholly confined to the trade. In consequence the tone of the market is weak, and in case of part of the list prices are a shade lower. The only railroad offering the past week was by the Cotton Belt, 400 tons. Stocks in dealers' hands are of moderate volume compared with late years at this season. We quote dealers' prices, per gross ton, f.o.b. St. Louis, as follows:

Old iron rails.....	\$15.50 to \$16.00
Old steel rails, rerolling.....	15.50 to 16.00
Old steel rails, less than 3 ft.....	13.50 to 14.00
Relaying rails, standard sections, subject to inspection.....	26.00 to 26.50
Old car wheels.....	15.00 to 15.50
Heavy melting steel scrap.....	13.50 to 14.00
Frogs, switches and guards, cut apart.....	13.50 to 14.00

The following quotations are per net ton:

Iron fish plates.....	\$14.00 to \$14.50
Iron car axles.....	21.00 to 21.50
Steel car axles.....	19.50 to 20.00
No. 1 railroad wrought.....	14.00 to 14.50
No. 2 railroad wrought.....	13.00 to 13.50
Railway springs.....	12.50 to 13.00
Locomotive tires, smooth.....	16.50 to 17.00
No. 1 dealers' forge.....	11.00 to 11.50
Mixed borings.....	7.00 to 7.50
No. 1 busheling.....	12.00 to 12.50
No. 1 boilers, cut to sheets and rings.....	10.00 to 10.50
No. 1 cast scrap.....	12.50 to 13.00
Stove plate and light cast scrap.....	9.50 to 10.00
Railroad malleable.....	12.00 to 12.50
Agricultural malleable.....	10.00 to 10.50
Pipes and flues.....	10.00 to 10.50
Railroad sheet and tank scrap.....	9.00 to 9.50
Railroad grate bars.....	9.50 to 10.00
Machine shop turnings.....	10.00 to 10.50

Geo. D. Rosenthal of St. Louis, who is promoting an electric railroad from Mexico, Mo., to this city, has purchased the bridge across the Missouri River at Jefferson City from the Jefferson City Bridge & Transit Company. The price is said to be \$200,000, though the figures are not made public. It is a wagon bridge and will be used for the electric line.

Buffalo.

BUFFALO, N. Y., April 12, 1910.

Pig Iron.—The demand has been comparatively light, there having been a considerable falling off in inquiry; nevertheless, orders for varying amounts up to 600 tons, two for 1000 tons each, and one of 2500 tons have been entered, mostly for foundry grades. There still appears to be great uncertainty in the minds of buyers as to whether the present trend toward lower prices will continue, and this serves to postpone purchases. Shipments on contracts have been going forward from furnaces in exceedingly large volume during the week. The B Niagara furnace of the Tonawanda Iron & Steel Company went out of blast on Saturday for relining, after a run of seven years and eight months. We quote as follows for second and third quarter delivery, per gross ton, f.o.b. Buffalo:

No. 1 X foundry.....	\$17.00 to \$17.50
No. 2 X foundry.....	16.50 to 17.00
No. 2 plain.....	16.25 to 16.75
No. 3 foundry.....	16.25 to 16.50
Gray forge.....	16.00 to 16.25
Malleable.....	16.75 to 17.25
Bessemer.....	18.00 to 18.50
Basic.....	16.75 to 17.25
Charcoal.....	19.50 to 20.00

Finished Iron and Steel.—The demand for bars is very strong and seems to have grown out of all proportion to any other line of finished products in the steel business. Prices are firmly held, mill deliveries becoming more extended. The inquiry for cold drawn steel is also good and a number of contracts have been closed during the week. Tin plate and tin mill products still continue active, although contracts for the latter for the remainder of the year have been placed to a large extent. The week has shown a fair amount of activity in structural lines, with considerable new business developing. The Ontario Power Company is receiving tenders for about 400 tons of bent and punched plates and shapes in connection with the new intake and distributor to its power house on the Canadian side of the river at Niagara Falls. Bids are to go in this week for steel for the department store building for the McCurdy & Norwell Company, Rochester, about 100 tons. The American Bridge Company has been awarded contract for steel for the stack and tank shop of the Erie City Iron Works, Erie, Pa., about 250 tons. The Buffalo Structural Steel Company has received contract for steel, about 100 tons, for addition to the Pierce plant of the American Radiator Company, Buffalo.

Old Material.—An improvement in the demand for heavy melting steel is noted and a fairly good tonnage of such

scrap is moving on contracts. Prices are held about the same as last week, although with a slightly weaker tendency in a few lines. We quote as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel.....	\$15.25 to \$15.75
Low phosphorus steel.....	19.50 to 20.00
No. 1 railroad wrought.....	16.50 to 17.00
No. 1 railroad and machinery cast scrap.....	15.50 to 16.00
Old steel axles.....	19.50 to 20.25
Old iron axles.....	23.00 to 23.50
Old car wheels.....	16.00 to 16.50
Railroad malleable.....	15.50 to 16.00
Boiler plate.....	13.00 to 13.50
Locomotive grate bars.....	12.00 to 12.50
Pipe.....	12.50 to 13.00
Wrought iron and soft steel turnings.....	8.50 to 9.00
Clean cast borings.....	7.75 to 8.25
No. 1 busheling scrap.....	13.50 to 14.00

Iron and Industrial Stocks.

NEW YORK, April 13, 1910.

The stock market received quite an impetus on Monday when the announcement was made that the United States Supreme Court had decided to call for reargument on the American Tobacco and Standard Oil cases. This action was wholly unexpected, as it appeared to indicate a close division of the members of the court on the questions at issue. The prices on active stocks advanced rapidly from the low levels of the week reached on Saturday and early Monday morning. The range of prices on active iron and industrial stocks from Thursday of last week to Tuesday of this week was as follows:

Allis-Chalm., com.....	104 1/4 - 104 3/4	Railway Spr., com.....	40 - 42
Allis-Chalm., pref.....	36 3/4 - 38 1/4	Railway Spr., pref.....	101
Beth. Steel, com.....	30 - 31 1/4	Republic, com.....	36 - 38
Can, com.....	10 1/2 - 11 1/4	Republic, pref.....	99 1/2 - 101
Can, pref.....	72 1/2 - 76	Sloss, com.....	75 1/2 - 78
Car & Fdry, com.....	61 1/4 - 64 1/4	Sloss, pref.....	119
Car & Fdry, pref.....	115	Pipe, com.....	21 1/4 - 24
Steel Foundries.....	56 1/4 - 57	Pipe, pref.....	71 - 73
Colorado Fuel.....	38 1/4 - 40 1/4	U. S. Steel, com.....	81 1/2 - 86 1/2
General Electric.....	149 1/2 - 152 1/2	U. S. Steel, pref.....	119 - 122
Gr. N. ore cert.....	64 1/2 - 68 1/2	Westinghouse Elec.....	62 1/2 - 67 1/2
Int. Harv., com.....	92 - 94 1/4	Am. Ship, com.....	75 - 77 1/2
Int. Harv., pref.....	123	Chl. Pne. Tool.....	45
Int. Pump, com.....	42 1/2 - 46 1/2	Cambria Steel.....	47 - 48 1/2
Int. Pump, pref.....	83 1/2 - 85	Lake Sup. Corp.....	21 1/2 - 23 1/2
Locomotive, com.....	49 1/2 - 53	Pa. Steel, pref.....	115 - 117
Nat. En. & St., com.....	20 1/2 - 23 1/2	Warwick.....	11 1/2
Nat. En. & St., pref.....	86 - 90	Crucible St., com.....	13 1/2 - 14 1/2
Pressed St., com.....	41 1/2 - 44	Crucible St., pref.....	84 1/2 - 86
Pressed St., pref.....	101 1/4		

Last transactions up to 1 p.m. to-day are reported at the following prices: United States Steel common 87½, preferred 122, bonds 104½; Car & Foundry common 64, preferred 115; Locomotive common 52½, preferred 112; Colorado Fuel 40½; Pressed Steel common 48½, preferred 101½; Railway Spring common 42; Republic common 38, preferred 101; Sloss-Sheffield common 78½; Cast Iron Pipe common 24, preferred 72½; Can common 11½, preferred 75; Allis-Chalmers common 11, preferred 38½.

A court order was recently issued in New Jersey restraining the Southern Iron & Steel Company from issuing 10,000 shares of new stock, 7143 of which were to provide for the convertible feature of \$500,000 additional 6 per cent. bonds, the issue of which is also restrained. Under the New Jersey law the preferred stock must be issued and sold at par, whereas the transaction enjoined amounted to a sale at 70.

Dividends.—The H. R. Worthington Company has declared the regular quarterly dividend of 3½ per cent. on the preferred stock, payable May 2.

The International Steam Pump Company has declared the usual quarterly dividend of 1½ per cent. on the preferred stock, payable May 2.

J. G. White & Co., Inc., have declared the regular quarterly dividend of 1½ per cent. on the preferred stock, payable May 2.

The House of Representatives April 8 passed the Naval Appropriation bill in its original form, authorizing the construction of two battleships of the first class in the next fiscal year. The bill also provides for the construction of two fleet colliers and four submarine boats. The battleships and colliers must be constructed by firms observing the eight-hour law. The total amount carried by this bill is \$128,037,602. A provision for a repair ship to cost \$1,000,000 failed to receive approval.

No. 3 blast furnace at the Ohio Works of the Carnegie Steel Company, Youngstown, Ohio, has been blown out for relining and repairs. The other five stacks at these works are in operation, making an average of 500 tons per day each.

New York.

NEW YORK, April 13, 1910.

Pig Iron.—The market is dull, though current shipments continue at a rate indicating that foundries are not slackening their pace. Southern sellers have been making offers that Northern furnaces have not been disposed to meet, \$12, Birmingham, for No. 2 being quoted by furnace companies for second quarter shipment. Pipe foundries on the Delaware River seem to have their needs in the next few months quite well provided for and demand for forge iron from rolling mills is very light. An inquiry for 1000 tons of iron for Brooklyn is the largest business of the week. Prices are weaker and indicate more strongly that production is greater than can be absorbed. One New Jersey furnace blew out this week and another is scheduled to go out in a few days. We quote as follows on Northern iron at tidewater: No. 1, \$18 to \$18.25; No. 2 X, \$17.50 to \$17.75; No. 2 plain, \$17.25 to \$17.50. On Southern iron we quote \$17.50 to \$17.75 for No. 1 and \$17 to \$17.25 for No. 2.

Steel Rails.—Some business is pending in the Chicago district, Western roads having come into the market with second orders for 1910, on which mills in that district will not be able to make the desired deliveries. The Kanawha, Glen Jean & Eastern Railroad Company has bought 1000 tons at Pittsburgh and the American Railways Company, which controls a number of trolley lines, has bought 1000 tons from the Pennsylvania Steel Company. The international rail trade continues fairly active. Among recent business taken by British mills was 9000 tons for the Indian Office and 6000 tons for Ceylon, taken by Bolckow, Vaughn & Co.

Ferroalloys.—Ferrosilicon is quoted at about \$61 in this market. Some trading has occurred in the past 10 days, but not enough to affect the price. Ferromanganese is very dull, no business being reported. The nominal quotation of 80 per cent. ferromanganese is \$41.50, Baltimore, with no prospect of an early advance.

Finished Iron and Steel.—Inquiries are not numerous in any line. Orders are generally small. Among the contracts placed for structural work are the following: Phoenix Bridge Company, 700 tons from the Southern Railway; McClintic-Marshall Construction Company, 1600 tons from the Hocking Valley and the Toledo & Ohio Central, joint work, at Columbus, Ohio; Lackawanna Bridge Company, 300 tons from the Northern Pacific; American Bridge Company, 2000 tons from Corrigan, McKinney & Co., Josephine, Pa.; 850 tons for a warehouse at Boston; 300 tons of bridge work from the Atchison, and 200 tons from the Pennsylvania Lines West; Milliken Brothers, Inc., 1000 tons for a building at Fourth avenue and Twenty-sixth street, New York; Hansell-Elcock Company, 450 tons for the Continental Bolt & Iron Works, Chicago. Other contracts understood to have been placed were 300 tons for the Virginian Railway and 500 tons for a loft building on West Twenty-eighth street, New York. Bids go in this week on 8000 to 9000 tons on the New York Central's Merchants' and Manufacturers' Building, New York; 2000 tons for bridge work for the New Haven; 1300 tons for a building in Tacoma, Wash., for the famous lumber operator, Weyerhaeuser; 1300 tons for the New York Polyclinic Hospital; 800 tons for the Hackensack River bridge on the Erie Railroad; 600 tons for a loft building on West Twenty-second street, New York, and 400 tons for bridge work for the Chicago, Burlington & Quincy. Inquiries are in the market for 650 tons of bridge work for the Lake Shore; 600 tons for an office building for the Philadelphia & Reading; 500 tons of bridge work for the Rock Island; 300 tons for a building for Barnard College, New York, and 200 tons of bridge work for the Central Railroad of New Jersey. Competition is keen among fabricators. The Eastern shops are conspicuous in this respect, as not enough work is coming out to satisfy the enlarged capacity of mills, and fabricating shops in the Eastern part of the country. Considerable improvement is observed in structural business in the Central West, where this branch of trade has been active for months, and better prices are being secured there than in the East. Plates and plain structural material are quoted at 1.66c. to 1.71c., steel bars at 1.61c. to 1.66c., and bar iron, railroad test, at 1.65c. to 1.70c., tidewater.

Cast Iron Pipe.—In addition to a contract for about 2500 tons to be opened to-day by the Department of Water Supply, Gas and Electricity of the City of New York, bids will be opened April 20 for 9000 tons of principally 20-in., but including other sizes down to 8-in., for high pressure service for Brooklyn. Other public lettings are few. Quite a good number of small orders are being received from private water and gas companies. While the volume of business of this character is far better than at the corresponding time last year, it is considerably under previous years. Quotations are continued at \$25.50 to \$26 per net ton, tidewater, for carload lots of 6-in.

Old Material.—The railroad lists out this month are considerably heavier than had been expected. The railroads have for months been offering large quantities of old mate-

rial, but dealers are now of the opinion that the supply from this source will continue large for the next month or two, as the spring is always conspicuous in renewals and repairs which result in the placing of much discarded material on the market. Dealers who have made bids much under the market on some of these lists have been somewhat surprised by having their offers accepted. The market for steel scrap is exceedingly quiet, apparently the only buyers being dealers who still have contracts to fill. The mills have been thoroughly canvassed, but all seem to be well supplied at present. A feature in railroad wrought is that some large consumers are offering fair quantities for resale. The activity in machine shops is causing a heavy production of borings and turnings which are decidedly weak as a result. Car wheels are absolutely neglected. Relaying rails are in quite strong demand. Cast scrap continues fairly active. Rolling mills are buying to some extent, but are exceedingly cautious in making purchases, evidently having little confidence in the maintenance of values. It is somewhat remarkable under the circumstances that prices hold so well. It is possible that yard steel scrap can be purchased lower than our quotations, which are for railroad or other varieties of steel scrap, which fully meet the specifications of the steel mills. The following quotations are per gross ton, New York and vicinity:

Re-rolling rails.....	\$14.50 to \$15.00
Old girder and T rails for melting.....	14.25 to 14.75
Heavy melting steel scrap.....	14.25 to 14.75
Relaying rails.....	22.50 to 23.00
Standard hammered iron car axles.....	25.00 to 25.50
Old steel car axles.....	19.00 to 19.50
No. 1 railroad wrought.....	16.00 to 16.50
Wrought iron track scrap.....	14.50 to 15.00
No. 1 yard wrought, long.....	14.50 to 15.00
No. 1 yard wrought, short.....	14.00 to 14.50
Light iron.....	8.00 to 8.50
Cast borings.....	8.50 to 9.00
Wrought turnings.....	10.50 to 11.00
Wrought pipe.....	13.50 to 14.00
Old car wheels.....	14.50 to 15.00
No. 1 heavy cast, broken up.....	14.00 to 14.50
Stove plate.....	11.00 to 11.50
Locomotive grate bars.....	11.00 to 11.50
Malleable cast.....	15.00 to 15.50

Metal Market.

NEW YORK, April 13, 1910.

THE WEEK'S PRICES.

Copper.			Lead.		Spelter.	
April.	Lake.	Electro-lytic.	New York.	St. Louis.	New York.	St. Louis.
7.....	13.75	13.00	4.40	4.25	5.60	5.45
8.....	13.75	13.00	4.40	4.25	5.60	5.45
9.....	13.75	13.00	4.40	4.25	5.60	5.45
11.....	13.00	12.87½	4.40	4.25	5.60	5.45
12.....	13.00	12.87½	4.40	4.25	5.60	5.45
13.....	13.00	12.87½	4.40	4.25	5.60	5.45

The copper market is interesting. Following a sharp drop in the price of lake copper on Monday, there was some fairly good buying. Tin is dull. Although stocks are plentiful they are fairly well concentrated. Spelter is featureless and lead is very listless.

Copper.—There has been considerable trading in copper since Monday and inquiries indicate that consumers are willing to buy at reduced prices which were made on that day. There was a sudden drop in lake copper, which was unexpected by the majority of people interested in the trade. It was brought about by the announcement that Calumet & Hecla was willing to take 13c. for lake copper, whereas the week before it had been steadily demanding 13.75c. This sudden change of front caused a rush to buy and some liberal orders were booked. Another big lake company made the cut on Tuesday and now any quantity of lake copper can be had at 13c. Electrolytic is selling well and the price on that grade of metal has also slipped off. Sales have been made for delivery in the Naugatuck Valley at 12.87½c., and to-day there were plenty of offerings in New York at that price. Electrolytic has not been selling as well as lake, and it will take a good deal of buying to make any appreciable reduction of stocks, as the recent report of the Copper Producers' Association, which is published elsewhere, indicates stocks as very heavy. Following the reduction here Monday, London came lower, and the market there is weak. The London market to-day was £56 17s. 6d. for spot copper and futures closed at £57 17s. 6d. Spot sales amounted to 700 tons and futures 1000 tons. The market is reported as steady.

Waterbury Average.—The Waterbury average for March was 13.75c.

Pig Tin.—Tin is quiet and unsatisfactory. Stocks are very plentiful, although they are said to be held by a few people. There are a few sellers of tin just now because the market has been below the cost of import for several days. The New York market closed to-day at 32.45c. London prices to-day were £147 10s. for spot tin and £149 10s. for futures. Sales amounted to 300 tons of spot and 600 tons of futures. The London market is reported as weak.

Tin Plates.—The restless labor conditions in many manufacturing plants, and especially among the tinware manufacturers, has caused a rather noticeable falling off in the demand for tin plates. This has not eased up the situation at the mills, however, and they are still booked far ahead. The leading interest is asking \$3.84 for 100 lb. coke plates, while other sellers are getting premiums of 10c. to 15c. a box. The market in Swansea plates is very sensitive and seems to be following the pig tin fluctuations. The price for plates at Swansea now is 13s. 11½d.

Lead.—Lead is so quiet that an order for anything over a carload would cause something of a sensation. The price has been stationary all the week and buyers who are undoubtedly in need of lead stubbornly refuse to pay what the sellers demand. They know that stocks are heavy and they seem to be holding out for lower prices. Lead is now selling at 4.40c. New York and 4.25c. St. Louis.

Spelter.—There have been few transactions in spelter and inquiries are decidedly scarce. Consumers are taking the metal only as they need it, and hand to mouth buying is always unsatisfactory. The price in New York is 5.60c.

Antimony.—There is nothing of interest in the antimony market. Hungarian grades are still offered cheap, although not in such large quantities. Hallett's can be bought for 8.25c. and Cookson's for 8.37½c. to 8.50c. The lesser known grades can be had for 7.50c.

Old Metals.—The market is heavy, with only a small volume of business. Dealers' selling prices are quoted as follows:

	Cents.
Copper, heavy cut and crucible.....	12.50 to 12.75
Copper, heavy and wire.....	12.25 to 12.50
Copper, light and bottoms.....	11.25 to 11.50
Brass, heavy.....	9.00 to 9.25
Brass, light.....	7.50 to 7.75
Heavy machine composition.....	11.75 to 12.00
Clean brass turnings.....	8.25 to 8.50
Composition turnings.....	10.00 to 10.25
Lead, heavy.....	4.15 to 4.25
Lead, ten.....	3.90 to 4.00
Zinc scrap.....	4.50 to 4.75

The Orient Railroad.

A new transcontinental railroad is being quietly built between Kansas City and Topolobampo, Mexico, says William E. Curtis in the *Chicago Record-Herald*. It is already three-fourths completed, and two-thirds of the distance is in operation. It will be the shortest line between the Missouri River and the Pacific Ocean, 518 miles shorter than the Union Pacific and 700 miles shorter than the Burlington or Rock Island routes, which are the shortest lines at present. The new Kansas City, Mexico & Orient Railroad, as it is called, starting from Kansas City, passes through the southeastern corner of Kansas, divides Oklahoma almost in half, bisects the western section of Texas, crosses the Rio Grande at Presidio del Norte, and then runs via Chihuahua to the port of Topolobampo, which is near the mouth of the Gulf of California, a short distance above Mazatlan.

Topolobampo has the most advantageous and convenient harbor on the Pacific coast of Mexico, and, indeed, it is the only one that is well protected. All of the other harbors are open to the western gales, and sometimes steamers are not able to discharge or receive cargoes on account of the weather. At Topolobampo vessels can lie up against a dock, entirely protected on all sides. Some years ago an American company started a Socialistic colony at that point, but it expired after a brief existence with disastrous results to those who participated in the movement.

Runs Through a New Country

The Orient, as it is familiarly known, runs through an entirely new country for a distance of 1659 miles, and, instead of paralleling established roads, it will cross several important lines with which its management can doubtless make traffic arrangements of mutual value.

Of the entire line 73 miles is in operation in Kansas, 200 miles in Oklahoma, 237 miles in Texas, 287 miles in Chihuahua and 75 miles in the state of Sinaloa. Between Wichita, Kansas, and San Angelo, Texas, a distance of 510 miles, two trains are running daily each way, and for a portion of the distance three trains.

The maximum grade through Kansas is 1 per cent., in Texas 1½ per cent., and when the road begins to ascend the mountains in Mexico the maximum of 2½ per cent. is attained. The road occupies what is said to be the only practical pass across the Sierra Madres Mountains, which was found after a search of five years, and a cost of nearly \$1,000,000 in surveyors' expenses. It was believed for a long time that the trains would have to be let down the western slope by some kind of machinery.

Some of the most difficult sections of the road have been completed and trains are now in operation over the pass, 8152 ft. above sea level, in the State of Chihuahua.

Built Without the Aid of Wall Street.

Topolobampo may never be a great shipping port for Asia and Central and South America, as some of the people interested in this new road have predicted. The commerce of San Francisco, Portland and Seattle is not likely to be transferred to that port, but the Orient Railroad will open up more different sources of wealth than any road that has been constructed since the first track was laid across the Continent. It will be unique for another reason. It has been built without the aid of a dollar from Wall Street. Thus far it has cost about \$20,000,000, which has been raised by the sale of stock and by subsidies from the Federal Government of Mexico, and the States, counties and towns through which it passes. The general government has contributed \$3,555,000, the State of Chihuahua \$600,000 and the State of Sinaloa \$200,000. Nearly every county in Oklahoma, Kansas and Texas, through which it passes, has voted a bonus, and more than 4000 people have purchased the stock.

The average cost of construction thus far has been only \$24,000 per mile, and the funded debt is only \$39,827,500. Upon the completion of the road it will carry obligations to the extent of \$20,000 a mile in bonds, \$16,000 in preferred stock and \$12,500 per mile in common stock.

The president and projector is A. E. Stillwell of Kansas City, who built the Kansas City, Pittsburgh & Gulf Railroad; the vice-president and general manager is E. Dickinson, who for 30 years was with the Union Pacific and 13 years its general manager.

From Ore to Galvanized Sheets.

"The Story of an Inland Galvanized Sheet" is the title of an attractive pamphlet, one of the most noteworthy, perhaps, of the "stories" published in the last halfdozen years relating to the operations of well-known self-contained companies manufacturing iron and steel. Excellent in paper, binding and illustration, this description of the operations of the Inland Steel Company, Chicago, carried on at its works at Indiana Harbor, Ind., has also the attraction of good literary quality. The writer starts at the Laura mine in the Hibbing district, Mesaba Range, and by illustration and text traces the various operations, including ore unloading, smelting in the Madeline furnace, refining in the open hearth furnaces into which molten iron is charged, casting into ingots, rolling in the blooming mill and sheet bar mill, finally taking up the processes of the sheet mill and the subsequent annealing, pickling and galvanizing. Illustrations are plentiful, including one of the main laboratory and branch laboratories. Some insight is given into the metallurgy of the subject as well as its mechanical features. The quality of the materials entering into the Inland galvanized sheets is given emphasis, and the care with which it is guarded and checked at every step. For the storing of its basic open hearth galvanized sheets, so that shipments can be made promptly, the company some time ago built a sheet warehouse 1183 ft. long. From its loading platform 30 cars can be loaded at once.

Central and South American Notes.

PUNTA ARENAS, C. A., March 12, 1910.—The republic of Salvador has signed a treaty of arbitration with the United States and a treaty of commerce with Germany. Salvador has been able to make a considerable saving in its budget for the fiscal year, although a number of public buildings and bridges have been constructed.

It is to be hoped that the United States Government will accept the offer of the Panama Government to build the very important link of the Pan-American Railroad between David and Panama, a line some 300 miles in length. British and German engineers and capitalists have been eager to control and build this line; in fact, British capitalists nearly got hold of it recently. The Panama Government is willing to have the line built by Americans and have it under American control. A number of surveys are now being carried on; in places the land is swampy, but in general it is flat, with small hills and no serious engineering difficulties to encounter. Through this Pan-American link, Costa Rica, Nicaragua, Salvador, Honduras, Guatemala and Panama would be in direct connection with Colombia and the Andean routes south of Buenos Aires.

Through the opening of the tunnel through the Andes range, which connects the railroad from Buenos Aires on the east to Valparaiso on the west, we may now expect to hear of important operations in the copper and gold regions of Chile. This republic, extending for nearly 1000 miles on the Pacific, is one vast mining region, which, as is well known, has produced large quantities of copper for many years. But not a hundredth part of Chile's mines have ever been worked. With this new transcontinental railroad everything may be expected to spring into life, from the Tarapac nitrate mines on the north, through the copper and silver regions, to Valdivia and the gold mines and cattle regions of the south. In 20 days from New York one can now land in Buenos Aires, a busy city of over 1,000,000 inhabitants, take a train and be in Valparaiso or Santiago on the west coast in less than two days more. Twenty years ago, even the most sanguine would have said it was impossible. Now, besides Chile, Bolivia, Peru, Ecuador and Colombia are linked commercially and generally with Buenos Aires.

The writer earnestly hopes that our government and our manufacturers, exporters and business men in general are doing their utmost to make a good American showing at the Buenos Aires International Exposition. Not only is Argentina of great importance to us, but, besides numberless Europeans, this exposition will be visited by millions from all over Spanish America. Montevideo, Rosario and Cordova are all of importance and nearby. The republics of Uruguay, Paraguay, Brazil, Bolivia, Chile, Peru and many other Spanish-American countries will be represented. The manufacturer who is well advertised by his products at Buenos Aires will reap important benefits from all over Latin-America at least for the next 10 years.

The government of Nicaragua is trying to sweep away all remembrance of revolution and start the wheels of business. Several of the mines on the west coast have started up work, and, if no filibusters annoy her from the outside, the little republic will soon be herself again.

The Salvador Government is steadily dredging and improving its ports and increased business is reported at La Union, Acajulta and Libertad.

The representatives of several American firms are now in Salvador and Guatemala investigating fraudulent trademarks on American goods. The courts are aiding our manufacturers in this matter. C.

The John Rohan & Son Boiler Works Company, St. Louis, Mo., advises us that an erroneous impression

has been created by the statement which appeared on page 766 of *The Iron Age* of March 31, regarding the sale of the company's building. The incorrect report has been circulated that the company's works had been sold. This was not the case, as only some ground and a building, which had been held under lease, were sold.

The Association of American Steel Manufacturers

At the recent annual meeting of the Association of American Steel Manufacturers steps were taken to make an important addition to the well-known manufacturers' standard specifications. This will be a standard specification governing the chemical and physical properties of concrete reinforcement bars, the need for which has for some time been apparent to all who are interested in reinforced concrete construction and the metal employed in it. This new specification will be published by the association upon formal adoption by letter-ballot, probably within the next few weeks.

Another subject of interest to the manufacturers and consumers of steel bars, which was also referred to ballot by the meeting, is a schedule of standard allowable variations in the size of hot rolled bars and in the weight of angles and other shapes of bar size.

All officers were re-elected, as follows: President, W. A. Bostwick, metallurgical engineer Carnegie Steel Company; vice-president, A. A. Stevenson, vice-president Standard Steel Works Company, Philadelphia; secretary and treasurer, Jesse J. Shuman, inspecting engineer Jones & Laughlin Steel Company, Pittsburgh.

The Standard Gauge-Connecting Rod Consolidation.

Official announcement is made of the consolidation of the Standard Gauge Steel Company and the Standard Connecting Rod Company, both of Beaver Falls, Pa. The new corporation is to be known as the Standard Gauge Steel Company. The works and general offices will be at Beaver Falls, Pa., to which all communications should be addressed. The full lines of products made by each of the companies will be continued and others are under consideration. These products consist of crank shafts, connecting rods, machine keys, machine racks, compressed steel elevator guides, angles, flats, squares and special shapes. A. Rasner, president of the new corporation, was formerly president of both corporations; J. T. Moltrup, formerly manager of the Standard Connecting Rod Company, is vice-president and general manager; Stephen Moltrup, formerly vice-president and general manager of the Standard Gauge Steel Company, is treasurer and assistant manager, and John A. B. Patterson, formerly secretary of the Standard Gauge Steel Company, is secretary and assistant treasurer.

The Warren City Tank & Boiler Company, Warren, Ohio, is making some extensive improvements in its plant and equipment, and will purchase two or three new riveters and a hydraulic flanging machine, and will also erect a steel building within the near future. It will also be in the market later on for some electric cranes, but will not be ready to take up inquiries in regard to them for two or three months.

The New Castle Iron & Steel Company, recently incorporated at New Castle, Pa., states that it is not interested in nor does it intend to build blast furnaces, steel works or a manufacturing plant of any kind. It is affiliated with the New Castle Forge & Bolt Company through some of its officials, and it supplies the latter concern with raw material, but has no other connections.

THE CORROSION OF IRON AND STEEL.*

Methods of Prevention—Tests Needed on a Large Scale to Measure the Relative Resistance of Different Kinds of Iron and Steel.

BY DR. CECIL H. DESCH.

It is unnecessary to insist on the great practical importance of the corrosion of iron and steel when employed in industry, for it is recognized as one of the most difficult problems with which the manufacturer and the user of those materials have to deal. Hence, it becomes desirable to devise methods for determining the resistance of iron and steel to corrosion, without having recourse to the costly and time-consuming method of exposure on the large scale. The view that all metallic corrosion is electrolytic in character is now established on a very firm basis. Numerous experiments have proved that the presence of an electrolyte (usually an acid) is necessary before corrosion can set in. But the other requirement of the electrolytic theory is less often dwelt upon, namely, that a second electrode must be present. A piece of perfectly pure iron, could such a thing be obtained, would certainly not corrode in pure water or moist air, however long it might be exposed. I believe, also, that it would not corrode if immersed in an acid, if kept out of contact with other solids. Should, however, the piece of iron have a speck of mill scale or a particle of phosphide or similar impurity on its surface, an electrolytic couple would be set up at that point and corrosion would begin. All rusting and corrosion is due in the first instance to the formation of such local couples.

Tests to Measure Corrodibility.

A laboratory test which would enable one to decide which of two materials would better resist exposure to corroding influences would be useful in a great variety of cases. Exposure to conditions similar to those under which the finished product is to be employed requires far too long a time to be available as a method of testing, and some form of accelerated test is, therefore, required. Three tests employed for the purpose are: The acid corrosion test, the measurement of differences of potential and the ferroxyl test.

1. *Acid Test.*—We may immerse the specimens to be compared in a dilute acid, and measure the loss of weight of each specimen at intervals. Manufacturers object to this test, and as it seems to me with justice, for the conditions are very unlike those to which structural steel is exposed. The fact that the corroded material is dissolved away, instead of forming a rust or coating, leads to marked differences between the two cases. Frequently the behavior on exposure is quite different from that which might be expected from the results of the acid test.

2. *Potential Difference Tests.*—We may immerse the specimens in an electrolyte, such as a salt solution, and measure the differences of potential between them by means of a galvanometer or an electrometer, using, if we please, a standard electrode for comparison. This method has been adopted in many scientific investigations dealing with corrosion, but from numerous experiments I have made in this direction, and from a critical comparison of the published figures of others, I have reluctantly come to the conclusion that it is quite untrustworthy. The potential differences vary in a capricious manner, sometimes changing sign more than once in the course of an experiment, and after a few days the specimens often settle down at the same potential—that is, their difference becomes zero. These curious changes are the result of polarization, and the

polarizing effect of specks of accidental impurity is sometimes so great as to mask all other differences.

3. *Ferroxyl Test.*—Prof. W. H. Walker has devised an ingenious method of detecting the points at which corrosion commences, based on the fact that very small quantities of iron can be detected chemically by means of potassium ferricyanide. The "ferroxyl reagent" is a neutral solution of this salt and of the organic compound phenolphthalein, thickened with gelatine. A small specimen of the metal to be tested is placed in a glass dish, covered with the melted reagent, and allowed to cool. In a few hours at most, blue specks appear wherever any iron is dissolving, while at the point acting as cathodes, bright pink areas appear, owing to the formation of alkali, which reacts with the phenolphthalein. A particle of mill scale, for example, at once becomes pink, while blue specks or centers of corrosion are seen in its neighborhood.

Strain Predisposes to Corrosion.

But there are other differences besides those of chemical composition which are capable of setting up electrolytic action. First among these is the effect of mechanical strain. If you take a piece of wire and test it in the ferroxyl reagent, you will always find that the cut ends become blue, and if you hammer one-half of the wire, the strained part becomes blue and the other part pink; that is, the strained wire corrodes more rapidly than the unstrained. In a piece of metal subjected to different degrees of working in different parts, the most severely strained parts will be, other things being equal, the first to corrode. This is in accordance with scientific teaching. Mr. Beilby has shown that the effect of work is to convert the crystals of the metal in part into a hard, amorphous form. This amorphous material, which contains an additional quantity of energy stored up in it, dissolves more readily in reagents and gives out more energy in dissolving than the unstrained metal. Cutting, hammering, rolling, drawing, all have the effect of increasing the tendency to corrode, when placed in contact with unworked metal, which then forms the cathode. Annealing removes this effect of work and restores the crystalline structure, but wherever metal which has been worked subsequently to annealing is placed in contact with annealed metal, there is liability to corrosion. Using the ferroxyl test, it is easy to convince ourselves that even a slight pinch of the metal with the pliers or a tap with the hammer is sufficient to determine the points at which corrosion will start.

It is interesting to consider whether a metal actually under stress below the elastic limit is more liable to corrode than one free from stress. American experiments, very carefully performed, indicate that there is a minute electrical difference between the parts, but it proved difficult to measure. It would be interesting to know whether, in a steel structure, any differences in the tendency to corrode are noticed between those parts in considerable tension, for example, and those bearing a very much smaller stress. The electrolytic difference must be very small, but it may quite conceivably be sufficient to determine the points at which corrosion will begin. The observations would be difficult, on account of the presence of so many disturbing factors.

Chemical lack of homogeneity is a defect which tends to disappear as the processes of manufacture are improved, and good mild steel is now a surprisingly

* From a paper read before the West of Scotland Iron and Steel Institute, Glasgow.

homogeneous material. The presence of much phosphorus or sulphur gives rise to the formation of electrolytic couples, and thus initiates local corrosion. Certain alloy steels far surpass ordinary carbon steel in their power of resistance to corrosion.

The Problem of Stray Electric Currents.

One of the auxiliary causes most powerfully assisting corrosion is the presence of stray currents, due to leakage from electric tramway or other plants. Such currents often exist, in an unsuspected form, in the neighborhood of generators, and puzzling cases of boiler corrosion may occasionally be due to this cause. I heard lately of some serious and continued pitting of Muntz metal condenser tubes being traced to this cause, and the same thing may hold true of steel plates and stays in similar positions. The corrosion of iron pipes laid in the ground near to electric tramways is one of the familiar problems of the engineer. It is easy to see that, if we have a considerable current leaving a pipe at some point where it is in contact with moist earth, the corrosion at that point may be many times more severe than is possible under the sole influence of the local couples of which I have previously spoken. Iron is dissolved at that point, and serious pitting is rapidly set up. The intensity of the action depends on the area over which the current is leaving the pipe, that is, the anodic area, which would become blue if we were to apply the ferroxyl test. Cathodic areas, at which current is entering the pipe, are of little importance when we are dealing with iron, but are important in lead pipes, where serious corrosion has frequently been started by the electrolysis of salts in the earth, forming an alloy of lead and sodium, which is washed out by water, leaving a pit. It is unfortunate that there are no satisfactory means of measuring the stray currents thus passing between underground pipes and neighboring electric circuits. Two forms of appliances are in use, one depending on the measurement of differences of potential, the other on the measurement of the current flowing. Neither is satisfactory, owing to the difficulty of making contact, and to the almost invariable necessity of disturbing the ground. A trustworthy method of making such measurements would be a great boon to those who have to deal with such questions of corrosion. It is sometimes specified that the leakage shall not exceed a certain limit—so many milliamperes a square foot—but such rules have little value, owing, on the one hand, to the above-mentioned difficulty of making the measurements, and, on the other, to the fact that corrosion depends less on the total current leaving an area than on the maximum current leaving some minute speck. A current which appears safe may easily lead to serious pitting, if concentrated in a few isolated pin-points.

Protective Coatings and Zinc Plugs.

I pass now to the question of protecting iron and steel against corrosion. The action of most paints and coatings is mechanical, preventing the access of electrolytes. As long as the coating is perfectly intact and free from pinholes, the protection is necessarily perfect, unless the paint is itself capable of allowing salts, water and air to diffuse through it. This is actually the case with some oil paints. When, however, a defect or pinhole exists in the coating, or a flake becomes dislodged, exposing the metal, corrosion may begin. The paint may even assist corrosion if its electrochemical character be such that it becomes the cathode when placed in contact with iron. This is the case with magnetic oxide of iron, whether in the form of mill scale, of a Bower-Barff coating or of a paint. It is also the case with graphite. As soon as part of one of these coatings is worn or scraped away, areas of corrosion are formed. The tin of tin plate is another coating of this class. If we cover a piece of tin plate with ferroxyl reagent, every pinhole soon appears as a blue spot, and we can readily test the quality of the coating in this way.

The zinc coating of galvanized iron, as is well known, has different properties. When placed in contact with iron, it becomes the anode, and consequently lessens the liability of the iron to corrosion. Zinc plugs are, for this reason, often inserted into masses of iron. While this plan is useful where the whole is immersed in water, so that there is electrical contact and free circulation, it is of very little use in protecting against atmospheric corrosion. Professor Walker has shown by ferroxyl tests that the protected area extends only for a short distance around the zinc plug, the influence of which becomes negligible a little further away. The proposal, seriously made in America, to protect the entire foundations of a steel frame building against corrosion by anchoring a block of zinc in one corner is, therefore, useless.

Concrete as Protection.

The best protective coatings are those which are chemically quite inert, consisting of nonconducting materials, without electrochemical action. Preparations of tar, &c., of which the composition named after Dr. Angus Smith is a type, fulfill these conditions. They should be applied to a warm, dry surface, in order to prevent the formation of pinholes through which water might enter and cause flaking. Portland cement, properly applied, also forms a chemically inactive coating. The excess of alkali (lime) which it contains, serves as a guard against the entry of carbon dioxide or acid fumes. Steel embedded in concrete is perfectly protected against corrosion, being found in a bright condition after many years. In the preparation of reinforced concrete as a structural material, however, it is necessary that the mortar should be dense. A porous concrete, containing a large proportion of voids, allows water, possibly carrying corrosive substances, to enter, and channels are soon eaten through the mass, by means of which the steel is exposed to attack. Rusting once having set in, and being continued by the action of the percolating water, expansion of volume takes place, and disintegration of the surrounding concrete follows. There is no danger of this with dense, well rammed concrete. The action of surrounding liquids is confined to the narrow outer zone through which diffusion can take place, and deleterious substances are arrested before reaching the embedded metal. It is not fair to test concrete blocks reinforced with steel, as has been done in America, by immersing them in dilute acid. The lime is rapidly removed from the cement, channels are formed leading to the center of the mass, and corrosion naturally proceeds rapidly. Such a plan does not correspond with any conditions met with in practice.

The Need of Tests on a Large Scale.

In order to compare together different kinds of iron and steel as regards their resistance to corrosive influences, we require to make the experiments on a sufficiently large scale. I have already given my reasons for rejecting the acid test and the measurement of differences of potential as accelerated laboratory tests for deciding the practical value of the material. The ferroxyl test is undoubtedly a valuable one for determining the degree of homogeneity of a material, and for special purposes, such as the testing of coatings of tin or of paints, but it is powerless to decide between two specimens of, let us say, mild steel of similar quality but from two different works. We need systematic experiments on sufficiently large pieces of metal to eliminate the effect of accidental spots of scale abrasions, &c. The edges, again, differ in properties from the principal surfaces, and although we may coat the cut edges with a protective varnish in order to eliminate their action, yet in a small specimen the influence of the deformation caused in cutting extends for some distance inwards. Large specimens of a number of different materials need to be placed under similar conditions, in moist air, in water of different degrees of acidity, &c., and immersed in moist earth. Measurements

of their electrolytic potential might be made from time to time, and it would, perhaps, be found that the irregularities found in the laboratory were more or less smoothed out. A similar series of tests should be made with metal coated with different paints and coatings, for the influence of mass is particularly marked in these cases. I feel convinced that the bulk of the laboratory investigations, carried out with great care though they are, are of little use as a guide to the behavior of structural materials towards corrosive agents in practice. As a metallurgical chemist, I say this regretfully, and I believe that a systematic series of tests on a large scale would not only yield information of direct practical value, but would determine the lines on which laboratory tests, capable of giving the necessary information at less cost and with less trouble, could be devised. Corrosion is the product of a number of different factors which we are able to estimate separately by refined laboratory experiments, but which we experience the greatest difficulty in combining to cover the conditions of practice.

Changes Among Officials of the Crucible Steel Company.

The Crucible Steel Company of America, whose offices have been removed from the Frick Building and now occupy the entire twentieth floor and nine rooms on the nineteenth floor of the Henry W. Oliver Building, Pittsburgh, has recently made changes among its officials as follows:

C. C. Ramsey, formerly third vice-president and located in New York, has been appointed assistant to the president, with headquarters at Pittsburgh. O. H. Wharton, formerly fourth vice-president, has been appointed third vice-president, with headquarters at Pittsburgh. H. A. Brown, formerly superintendent of branches, has been placed in charge of the Eastern department, with the title of assistant general sales agent, with headquarters at New York. Morris A. Green has been appointed superintendent of branches, with headquarters at Pittsburgh, to succeed Mr. Brown, transferred to New York. All these changes are now in effect.

The Youngstown Sheet & Tube Company's Sheet Mills.—Some time ago the Youngstown Sheet & Tube Company, Youngstown, placed a contract with the Riverside Bridge Company, Martins Ferry, Ohio, for the erection of a steel building to take the place of an old wooden building which is to be torn down. Some new boilers will be put under puddling furnaces which this steel building will contain, and the new work will start about July 1. The eight new hot sheet mills recently built are practically ready for operation, and will begin to run next week. After the eight mills are in full operation it is the intention to make changes in the old building, which will probably keep the six old sheet mills idle for a period of four weeks to two months.

Shipments of the Westinghouse Electric & Mfg. Company for March were \$2,950,000 from the East Pittsburgh and Newark factories, and about \$500,000 from the three subsidiary companies, making a total of about \$3,450,000, or at the rate of over \$40,000,000 per annum. During March new orders were received considerably in excess of the shipments, while inquiries from prospective buyers indicate a further increase in the demand on the facilities of the companies.

That the steam turbo generator is coming into greater demand all the time is evidenced by the sales of the Allis-Chalmers Company. Since the first of the year 46 turbines have been sold. A little over four years ago the company obtained the right to manufac-

ture in this country the latest improved type of Parsons machine. The end of the first year saw only one unit in operation; but since then there has been a steady and rapid growth in sales, attaining a total capacity of over 300,000 hp. Of this aggregate 48.2 per cent. were sold during 1909 and 20.6 per cent. have been placed on orders since January 1, 1910. Practically every type of industrial enterprise is represented in the buyers of these turbines.

A Reinforced Concrete Building with Some Interesting Features.

The mushroom type of reinforced concrete floor, with no girders, presents rather interesting problems of attaching machinery both to the floor and to the ceiling. In the new reinforced concrete storehouse for the Pierce Arrow Motor Car Company, Buffalo, N. Y., inverted U bolts were placed at frequent intervals down the center of each longitudinal bay. Each bolt spanned three reinforcing rods in the floor slab, and extended about 4 in. below the ceiling line. These rods were threaded, so that it is a very simple matter to attach shafting, trolley tracks, piping, &c., to the ceiling.

This building may be used at some future time for manufacturing purposes, so that a wooden floor suitable for securely fastening machinery was installed in the two top stories. Sleepers with beveled edges were laid across the building on 16-in. centers on top of the structural concrete; $\frac{1}{2} \times 2 \times 12$ -in. steel strips were firmly attached to the under side every 12 in., and the space between filled with a 1-3-6 mixture of concrete. The flooring was then firmly nailed to these sleepers.

The contractor, the Aberthaw Construction Company, Boston, Mass., made a great record by completing this building, four stories, containing 107,500 sq. ft. of floor space, and turning it over to the owner in three months from the time it started work. Lockwood, Green & Co., Boston, were the architects and engineers.

The directors of the Seaboard Steel Casting Company, Chester, Pa., have voted to increase the capital stock from \$500,000 to \$750,000. The additional capital will be used to make improvements to increase the capacity of the plant. Much of this work has already been completed and new machinery and equipment are being installed. The officers elected are as follows: William C. Sproul, president; Joseph W. Cochran, secretary and treasurer; S. Everett Sproul, general manager; Daniel G. Stokes, comptroller, and J. J. Birtwell, superintendent.

The Erie Railroad announces that, owing to the falling off in general traffic, it has reduced the working hours of about 7000 shop men and car repair men from 55 hours to 45 hours a week. About 75 locomotives have been taken off for the same reason.

The Maryland Steel Company has started the second of its new 50-ton open hearth furnaces at Sparrows Point, Md., operated under the duplex system in connection with Bessemer converters.

The 600-ft. ore boat recently ordered from the Great Lakes Engineering Works by the Jones & Laughlin Steel Company will be named the Willis L. King, in honor of the vice-president of the latter company.

Crumwold Furnace of the Reading Iron Company, at Emaus, Pa., was blown in April 6 after an extensive overhauling. It had been out of blast for many months.

Niagara Furnace B of the Tonawanda Iron & Steel Company, North Tonawanda, N. Y., has blown out for repairs.

J. DISNEY, PRESIDENT,
Mechanical and Civil Engineers,
PITTSBURGH, PA.

THE MACHINERY MARKETS.

The machinery demand in the East is very brisk, and there is fully \$200,000 worth of business in sight in the New York market, which will be closed out within the next three weeks. There are inquiries from two railroads, both of which are of a preliminary nature, and will be followed by a larger volume of business. In Milwaukee there is a fair demand for general machinery, but shipments are somewhat in excess of the bookings. The buying for the account of metal working plants is still heavy, but the call from the motor vehicle trade has fallen off. Plants in that territory are crowded with work, and castings are hard to get for early delivery. Detroit is getting a good volume of business from the automobile trade, and in Pittsburgh the industrial plants are the best customers. In the South the activity in developing mineral resources is pronounced, and a great deal of contractors' equipment is being sold. The saw mills and lumber camps are excellent customers for used machinery to be installed in repair plants. Chicago notes a steady improvement in business, which has been gradually bettering during the past three weeks. The Big Four Railroad has just given a contract for new shops near Indianapolis, and will soon be a good customer for machinery in the Western market. The automobile trade continues the heaviest buyer in the Cleveland market, and the volume of inquiries there from other sources is only fair. This is also true of Cincinnati.

New York.

New York, April 13, 1910.

Fully \$200,000 worth of business has come in sight in the New York market within the last 10 days. Some of this is only preliminary buying for shop additions that have been planned and it will be followed by a larger volume of inquiries within a very short time. The Ingersoll-Rand Company, 11 Broadway, New York, is doing considerable buying for its Phillipsburg, N. J., shops, where a large amount of old equipment is to be replaced. It is estimated in the trade that the company will spend at least \$40,000. There is no list out, but there are many inquiries scattered among the trade, and it is understood that the buying will not be done from a list in this case.

The New York Central Railroad has inquiries out now for about \$20,000 worth of machinery which is to be installed in its West Albany shops, and it is understood that arrangements are being made for additional purchases before very long. The Pennsylvania Railroad has inquiries out covering a line of equipment for its Trenton, N. J., shops. Just now the company is asking principally for lathes, but additional specifications are being prepared under the supervision of those in charge of the Trenton shops and they will appear within a short time. The inquiries which straggled out after the large list recently closed up by the Baltimore & Ohio Railroad have been closed by that company, and it is understood that the buying in that direction has been completed for the time being. From this it can be seen that the machinery business is decidedly good and it promises to be so for the next few weeks. March was not an entirely satisfactory month. Some houses did an excellent business, but sellers of the smaller classes of machinery experienced a slight setback. There was some good business done during March in the way of small power equipment and there are some inquiries before the trade now for hydroelectric power plant machinery. A number of manufacturing projects are to be located in the immediate vicinity of New York shortly, and machinery dealers in the metropolitan territory will have a chance to do some good business in that direction.

The John W. Ferguson Company, Paterson, N. J., has been awarded contract by the New York, Philadelphia & Norfolk Railway Company, a branch of the Pennsylvania system, for the construction of new shops at Cape Charles, Va. The improvements are extensive and consist in part of a power plant, 70 x 75 ft.; machine shop, 70 x 102 ft.; erecting shop, 70 x 150 ft.; blacksmith shop, 22 x 53 ft.; a six-stall roundhouse, 75-ft. turntable, &c. All buildings are to be of brick, with concrete foundations and steel truss roofs. It is stated that about \$50,000 will be expended for new machinery. All machines will be electrically driven. In connection with this work there will be two 50,000-gal. water tanks, which are also to be purchased. D. S. Newhall, Philadelphia, Pa., is purchasing agent for the railroad company.

The Traction Materials Company, R. W. Marshall, general manager, 50 Church street, New York, has purchased a large site at Cranford, N. J., and will begin the erection of a plant there at an early date. Part of the necessary equipment will be moved from the company's Montrose, N. Y., factory. The company manufactures electrical railway specialties and does a general repair business, including the rebuilding of motors and generators.

The Gregg Company, Limited, Newburgh, N. Y., which

has purchased 50 acres of land near Hackensack, N. J., proposes to manufacture narrow gauge railroad equipment and other material. The amount to be invested in the buildings has not been decided upon as yet, but it is understood that considerable equipment will be bought. The company specializes in sugar plantation railroad equipment, cane car unloaders, &c.

One of the largest new enterprises in this immediate vicinity is the woolen manufacturing plant of the Furstman & Huffman Company, which is now in the course of construction at Passaic, N. J. When completed the factory will employ over 2000 hands. It is understood that most of the equipment has been purchased.

The New York Air Brake Company, with main offices at 165 Broadway, New York, will add a machine shop, 200 x 320 ft., to its plant at Watertown, N. Y. The structure will be of reinforced concrete construction and considerable new machine shop equipment will be required. Other improvements at this plant are also contemplated by the company.

The plant of the Dodge & Bliss Company, North Tonawanda, N. Y., is being equipped for electric drive. Considerable apparatus will be needed for their mill and box factory at intervals during the year.

Wm. Broadhead & Sons, Jamestown, N. Y., are adding to their motor equipment.

The Kyshtin Corporation, Ltd., St. Petersburg, Russia, has closed a contract in London for American machinery with which to equip a large sampling plant at one of the mines in the Ural Mountains. It includes jaw crushers, reduction rolls and a sample grinder, with accessory apparatus.

John Kelly, Inc., Rochester, N. Y., is having plans drawn for a six-story factory building, 90 x 380 ft., which will be equipped with motor driven machinery.

The Edw. J. Mack Canile Company, Syracuse, N. Y., will put up a new plant, for which boilers and some power apparatus will be among the requirements.

The Thomas R. Beggs Faucet & Valve Company has been organized at Englewood, N. J., to carry on a large plant for the manufacture of the specialties named. Albert Grasing is among the incorporators. A capital of \$200,000 has been provided.

J. H. Martin, Tonawanda, N. Y., is having plans drawn for an extension of the Martinizing Process Company's works. Equipment details have not yet been decided upon.

The capacity of the municipal power plant at Clifton Springs, N. Y., will be enlarged by the purchase of some additional machinery.

One or more alternating current motors of about 125 hp. capacity will be needed shortly by the Larkin Company, Buffalo, N. Y.

The Ingersoll-Rand Company is about to install a complete compressed air equipment for the Geo. W. Jackson Company of Chicago for its contract on section 54 of the Catskill Aqueduct at Yonkers, N. Y. The order covers compressors, drills, mountings and air reheaters.

The Sowers Mfg. Company has been incorporated at Buffalo, N. Y., with a capital stock of \$100,000, and will establish a plant in that city for the manufacture of engines and machinery. The incorporators are Franklin D. L. Stowe, Geo. L. Grabe and B. O. Kerr. Present offices, 786 Ellicott Square Building.

The Great Lakes Engineering Company, Detroit, Mich., has received contract for the installation of ice making machinery for the branch plant of the Webster Citizens Ice Company, Essex street and Richmond avenue, Buffalo, N. Y., 110 x 157 ft., one story and basement.

The United Indurated Fibre Company, Lockport, N. Y.,

is receiving bids for a large two-story addition to be made to its plant in that city, for which a considerable number of presses and other machinery equipment will be required.

The Dahlstrom Mechanical Door Company has commenced construction on a large addition to its factory at Jamestown, N. Y.

Spencer Kellogg & Sons, Edgewater, N. J., are building a large lined oil mill at that point.

Capt. F. T. Arnold, Constructing Quartermaster, United States Army, will receive bids until April 30 for the construction of an electric light and power plant at Fort Terry, N. Y. Specifications will be furnished by Capt. Arnold upon request.

The International Pulp Company, Gouverneur, N. Y., has under construction a power plant which will develop from 1400 to 2000 hp. The company will utilize part of the power and will market the rest.

The Hedden Iron Construction Company, Newark, N. J., has purchased land in East Elizabeth, a suburb of Elizabeth, N. J., on which it will erect a fabricating plant.

The Public Service Corporation of New Jersey, with offices in the Prudential Building, Newark, is arranging for the erection of a brick machine shop to be operated in connection with its Market street gas works at Jersey City. The building will be 35 x 83 ft., one story.

The Robins Conveying Belt Company reports extraordinary progress in the way of new business within the last few months. Thomas Robins, the founder and president of the company, states that the company has done as much business in the last three months as it did during the entire year of 1909.

Business Changes.

The King Bridge Company has removed its New York office to room 1040 Hudson Terminal Building, 30 Church street.

The Voorhees Rubber Mfg. Company has moved its New York office and store from 48 to 38 Dey street.

The Hauermann Metal Mfg. Company has moved from 242 East 122d street to 1098-1102 Brooks avenue, New York, where it has more commodious quarters.

Chicago.

CHICAGO, ILL., April 12, 1910.

The machinery business has been picking up steadily the past three or four weeks in Chicago and the dealers are very well satisfied with sales as well as inquiries. Political agitation during the winter caused the railroads to withhold their orders for equipment and manufactures generally held off waiting to see what would happen. This condition affected the trade until well into March, when the feeling of hesitation wore off. It is now generally recognized, however, that business conditions are so sound throughout the West that nothing need be feared from political sources and new enterprises are coming forward with more confidence. The older industries are also coming in with inquiries for additional tools as well as for new machines to replace old equipment, and many scattering orders are received from railroads.

The Big Four Railroad is letting the contract for the construction of new shops near Indianapolis, Ind., which will require nearly 6000 tons of structural steel, principally for frames and trussing roofing. The magnitude of the construction order indicates that the machine tool manufacturers will have a very large list to bid on during the summer or fall.

The A. D. White Machinery Company, Chicago, has obtained the exclusive agency for the Kelly shapers made by the R. A. Kelly Company, Xenia, Ohio.

The National Lead Company, St. Louis, Mo., has awarded a contract to the St. Louis Unit Construction Company for the erection of the following buildings: Stack building 43 x 422 ft., oil house 40 x 70 ft., stable and garage 33 x 70 ft., machine and carpenter shop 38 x 48 ft., furnace room 60 x 90 ft., office building and pump house 50 x 60 ft.

The Wayne Works, Richmond, Ind., manufacturer of agricultural implements, has plans in progress for a foundry building 58 x 136 ft.

The Muncie Gear Works, Muncie, Ind., has been incorporated with capital stock of \$250,000, and will in the near future erect a large plant on a site which it secured for this purpose some time ago. Electrical power will be used for operation throughout the plant. Additional machinery will be contracted for at a later date.

The Emerson-Brantingham Company, Rockford, Ill., manufacturer of farm machinery, has awarded the contracts for the erection of three new buildings. The buildings will be of cement construction and will consist of a wood storehouse 84 x 754 ft., three stories, warehouse 115 x 253 ft., three stories, and a blacksmith shop 150 ft. square.

The Starr Piano Company, Richmond, Ind., is taking bids for the erection of a factory building 64 x 100 ft., five stories.

The Showers Brothers Company, Bloomington, Ind., is erecting a furniture factory, boiler house and dry kiln which will contain 260,000 sq. ft. of floor space.

The Clinton Sugar Refining Company, Clinton, Iowa, is erecting four factory buildings of three and four stories.

R. J. Busch, 535 Forty-seventh street, Chicago, is erecting a factory and blacksmith shop 44 x 60 ft. at a cost of \$7500.

R. Lowenthal, 424 East Forty-eighth place, Chicago, is erecting a warehouse 50 x 100 ft., four stories, and a foundry 80 x 80 ft.

The Standard Asphalt & Rubber Company, Chicago, is erecting a one story factory building 55 x 144 ft. at Thirty-seventh and Wall streets at a cost of \$12,000.

John J. Gallery, 79 Elm street, Chicago, is taking figures for the erection of a manufacturing building 48 x 100 ft., six stories, to be erected at a cost of \$45,000.

James C. Curtis & Co., Chicago, manufacturers of caskets, is having plans prepared for a warehouse and factory, six stories and basement, the cost of which will be \$175,000.

The Pullman Company, Chicago, is having plans prepared for new car shops to be erected at Richmond, Cal. The plant will comprise several buildings and will cost about \$800,000.

Plans and specifications for the new buildings to be erected at La Fayette, Ind., by the American Motor Car Company of Indianapolis, have been completed and bids are now being received for their construction.

The Florsheim Shoe Company, Chicago, will enlarge its plant by the erection of a seven story addition and an extra story to the present building. The cost of the improvements is estimated at \$150,000.

The Champion Ignition Company, Flint, Mich., is enlarging its plant by the addition of two new departments, one of which will be used for the manufacture of magnetos and the other for porcelain, used in the manufacture of spark plugs. Most of the machinery used will be of special design.

The Evansville Store Fixture Company has been incorporated at Evansville, Ind., to manufacture store fixtures. The capital stock is \$10,000. The directors are D. S. Bernstein, S. J. Hauff and J. R. Ghormley.

The Cowie Window Company has been organized at Indianapolis, Ind., and incorporated with \$100,000 capital stock to manufacture a removable and adjustable window. The directors are A. M. Davis, E. B. Davis, Lew W. Cooper, Eugene Davis and Leonard M. Quill.

The Commercial Club of Terre Haute, Ind., has closed a contract with the A. W. Smith Mfg. Company, organized with Chicago capital, to locate a factory in Terre Haute to manufacture automobile parts.

The American Coating Mills has been organized at Elkhart, Ind., and has purchased the buildings formerly occupied by the Indiana Buggy Works. The main building is a three story brick, 65 x 120 ft., with two wings, one 60 x 95 ft. and the other 55 x 100 ft. The machinery will cost about \$75,000. The company will make coating for fine papers. Charles C. Colbert of Wabash, will be manager.

The Jennings Pump & Dredge Company has been organized in Chicago, with offices at 40 Michigan avenue. G. Cooke Adams is president and treasurer; William Duff Haynie, vice-president, and H. Harris Smith, secretary. The company will handle a patented centrifugal suction pump, of English design, which is new to this country, but has been extensively used abroad. No plant will need to be erected at present, as arrangements for manufacturing have been made with a prominent firm of pump builders who make a specialty of machinery of this class.

J. A. Risch, Locust and Chestnut streets, Vincennes, Ind., will be in the market for a boiler, pump, engine and power transmission machinery to be used in a branch plant which is to be built at Eldorado, Ill., by the Vincennes Milk Condensing Company.

Machinery to be installed in the Hicks Locomotive & Car Works, Chicago Heights, Ill., will be electrically driven, and 21 constant speed motors have been ordered for the purpose.

Another line of alternating current motors will be required for the factory of the American Maize Products Company, Roby, Ind., which already has nearly 200 in operation.

J. F. Richardson, Jr., Ottawa, Ill., is preparing plans for a factory building 20 x 100 ft., in which an electric power plant, motors and tools will be installed.

The Pomeroy Mail Bag Catcher & Delivery Apparatus Company has been organized at Logansport, Ind., and incorporated with \$10,000 capital stock, to manufacture a new device to be attached to postal cars. The directors are George W. Pomeroy, E. L. Pomeroy and Harry E. Klein.

George H. Loesch is at the head of a company being organized at Fort Wayne, Ind., with \$50,000 capital stock, which will manufacture automobile engines. An Eastern automobile factory has contracted to take the output of the new plant for three years.

Sealed proposals will be received at the office of the City Clerk, Colby, Kan., until May 3, for furnishing material and labor and constructing a system of water works and electric lighting plant. Separate bids will be received as follows: For furnishing material and labor and constructing electric light and water works system; for furnishing cast iron pipe and special castings; for furnishing hydrants and valves; for furnishing and erecting 70,000 gal. stand tower 100 ft. high and steel well towers; for furnishing three units of deep well pumping machinery; for furnishing two high speed engines for 45-kw. and 60-kw. units; for furnishing one 45-kw. and one 60-kw. generator switchboard, lighting equipment, etc.; furnishing all material and erecting a chimney 42 in. in diameter by 80 ft. high, and 1000 ft. of 2½-in. hose and two hose reels.

The Garden City Fan Company, Niles, Mich., is in the market for two pulley lathes and some engine lathes. The company would also like to receive catalogues of the representative machine tool manufacturers.

Philadelphia.

PHILADELPHIA, PA., April 12, 1910.

The recent betterment in the demand for machine tools appears to be fairly well maintained, both dealers and manufacturers reporting a good volume of business during the week. Some good orders for machine tools were placed in this city last week by a New York drill manufacturing company, and a Southern railroad was also a good buyer. Preliminary estimates are still coming out from the railroads as well as the large iron and steel working plants. In a number of these cases appropriations for the purchase of the equipment against which the inquiries have been made have not yet been authorized, but they are taken as indicating better buying in the future. Machine builders are taking on a very good volume of new business, the greater demand being for tools of a special character. Very little new business for export shipment comes out, although a few orders for Canadian delivery are to be noted.

Uncertainty in the delivery of steel castings still handicaps tool builders, while the effect of the demands of jobbing and machine molders and coremakers in this city for an advance in wages ranging from 10 to 18 per cent. is a factor yet to be taken care of. Deliveries on machine tools are still unsatisfactory in many instances. A number of purchasers have been able to fill their early requirements in the second-hand machinery field, in which dealers report fairly active conditions. Generally speaking, the demand for machine tools, special machinery and power equipment continues in comparatively good shape, and with the amount of new business in sight there are encouraging reports from both merchants and manufacturers.

The contract for the Columbia avenue station of the Philadelphia & Reading Railway has been awarded to Irwin & Leighton, contractors, Franklin Building. Elevators and conveniences for handling heavy traffic will be installed.

The Metropolitan Electric Company, Reading, Pa., expects to get its new power plant in that city in operation about June 1. The work of installing machinery and general equipment, boilers, &c., is going forward rapidly.

The Philadelphia Roll & Machine Company notes improved business conditions. This concern has just closed a contract for a complete outfit for a 24-in. sheet mill for shipment to Canada.

Dodge & Day, engineers, are quite busy on several large propositions, particularly in foundry work, announcements regarding which they will be ready to make in two or three weeks.

The contract for the erection of the additions to the plant of the Steel Heddle Mfg. Company, Twenty-first street and Allegheny avenue, has been awarded to H. H. Wehmeyer, 1621 North Fifth street.

The Royersford Foundry & Machine Company, Royersford, Pa., has recently installed machinery to facilitate the manufacture of its new Sells roller bearings, the demand for which is steadily increasing. Inquiries for heavy punch and shear machinery are reported numerous, although orders do not develop rapidly. One No. 3 punch and shear has just been shipped the Bronx Iron & Steel Company, New York.

The planing mill of Frank C. Shedaker & Co., Ninth and Tioga streets, was badly damaged by fire on April 8. The building was practically destroyed; particulars regarding the loss and probable rebuilding of the plant are not obtainable at this time.

It is reported that John D. Kuehn, Greensburg, Pa., has been awarded the contract to construct a 20-in. pipe line from the water supply of Lebanon, Pa., on South Mountain, to that city, while W. D. Chisholm, Pittsburgh, Pa., is understood to have the contract for a water distributing system in that city.

The Baldwin Locomotive Works, which recently received an order for 90 locomotives from the Southern Railway, has booked further orders, although of smaller size. More

active conditions are reported by this concern; labor difficulties, which existed in a comparatively small way some weeks ago, have been satisfactorily adjusted and an average of 100 workmen per week is being added to its forces. Delays in deliveries of raw material still handicap the operation of some departments of the plant.

The Lancaster Foundry Company, Lancaster, Pa., has been incorporated, with a capital of \$30,000, and is erecting a gray and malleable iron foundry, located on the main line of the Pennsylvania Railroad in that city. The building will measure 55 x 300 ft. and floor space to accommodate 60 molders will be provided. A 75-hp. engine, 125-hp. boiler, blower, cleaning room apparatus and minor machine shop equipment will be required. Two cupolas, orders for which have been placed, will be installed. The officers of the company are: President, Aaron B. Hess; vice-president and general manager, James R. Haldeman; secretary-treasurer, William V. Wisner.

It is interesting to note that the Department of Surveys, city of Philadelphia, has advised the City Councils that new bridges necessary to keep pace with the city's development would cost in the aggregate \$2,563,000. Of this amount, work to the extent of \$274,000 would have to be paid by local railroad companies individually, while partial costs on work, aggregating \$262,000, would also have to be taken care of by the railroads. The remainder would be at the individual expense of the city, which has nearly exhausted its appropriation for that class of work and has but \$100,000 available under a new loan. Some work, it is said, will be authorized in the near future.

The Auto Car Company, Ardmore, Pa., will erect at Twenty-third, Market and Ludlow streets, Philadelphia, a three-story and basement concrete garage, 106 x 120 ft. Stearns & Castor are the architects and engineers. The new garage will be for the company's own use and will be equipped with a general repair department.

Wilson, Harris & Richards, Philadelphia, have been selected as consulting architects for the erection of what is claimed will be the largest group of manufacturing buildings in the country. The plant will be erected by the General Electric Company at Erie, Pa., and will require an expenditure in excess of \$10,000,000. There will be in all some 50 buildings, with a combined floor space of 6,000,000 sq. ft. The buildings will be of concrete, steel and brick, and will occupy a plot 1 mile square. It is expected that one of the buildings, 300 x 800 ft., will be begun in the early fall.

Ballinger & Perrot, engineers, have awarded the contract for a two-story addition to the cabinet factory of the Victor Talking Machine Company, Camden, N. J., to J. S. Rogers & Co., Stanwick, N. J. The work will be started at once.

The Mayer & England Company, manufacturer of electrical supplies, has purchased a site for a new plant at Seventeenth and Cambria streets. It has commissioned Stearns & Castor to prepare plans for the necessary building, the exact nature of which has not yet been decided upon. The company will consolidate its several plants at the new location and will no doubt require additional equipment, both power and machinery, but at this time has no definite plans prepared.

W. K. Mitchell & Co., Inc., steam engineers and contractors, Twenty-ninth and Ellsworth streets, Philadelphia, call attention to the fact that the item printed on page 841 in *The Iron Age* of April 7, stating that Dougherty & Bachran are equipping a plant at Sixteenth street and Washington avenue, the old location of W. K. Mitchell & Co., might convey the impression that this firm has gone out of business. It therefore seems advisable to state that the firm moved to its present location in 1904, where it has since been conducting its business in the manufacture and installation of piping of power stations for all purposes.

The Parker Boiler Company, Pennsylvania Building, Philadelphia, received the fifth order from the John B. Stetson Company, Philadelphia, calling for one 750-hp. and two 391-hp. boilers; also orders from the Standard Essence Company, Maywood, N. J., for one 250-hp.; Nucoa Butter Company, Bayonne, N. J., for four 267-hp., and Belmont Iron Works, Eddystone, Pa., for two 265-hp.

The two story drafting building of the New York Shipbuilding Company, Camden, N. J., was destroyed by fire April 11. The estimated loss is \$100,000.

New England.

BOSTON, MASS., April 12, 1910.

Reports of a letting up in orders are heard from various lines of industry, including some branches of the machinery trade. The week has shown some little difference, though many establishments are running at full capacity. To repeat a word often used during the last six months, the situation is "spotty." The Boston dealers are making no complaint; their business is running along about the same as in preceding weeks. The market is featureless, excepting for lists already announced.

The O. S. Walker Company, Worcester, Mass., builder of grinding machines, has begun work on its new shop at Greendale. The building will be 100 x 180 ft., a portion of it one story, with monitor roof, the remainder two stories. The first floor will be devoted to machine shop purposes, while the second story will contain pattern shop, pattern storage, drafting room, &c. The company will probably purchase electric power from the local power company, though this is not fully decided. No plans have been made for increasing the machine shop equipment, and little may be bought this season. The new shops will afford a large increase in floor space, as compared to the present plant on Union street, and will permit of a continuation of the rapid growth which has come in recent years. The company is rushed with orders.

The Universal Machine Screw Company, Hartford, Conn., manufacturer of screw machines and screw machine products, expects to break ground for its new shop building next month. It will be a one-story structure with a floor space of about 29,000 sq. ft., and will probably have a roof of saw tooth construction. Electric power will be used.

The Grip Coupling Company, Springfield, Mass., manufacturer of threadless couplings, has acquired a tract of land at Ware, Mass., and will erect a factory on the site. The first section of the building will be 36 x 50 ft. The company states that it will not be in the market for machinery at this time.

The S. & I. Company, Springfield, Mass., manufacturer of hardware and plumbing specialties, is planning to erect a new factory this season, but has not completed its plans for the building.

The New York, New Haven & Hartford Railroad has made the announcement, important to shippers, that it will double track the Air Line division, the work to include the erection of a bridge across the Connecticut River at Middletown, to cost \$1,000,000. More important still in the scope of its effect upon the future is the decision of the company to complete a through line from New York to Sherbrooke, Quebec, by closing up two gaps in the Boston & Maine system in Vermont. Not only will New England be benefited directly, but fertile regions of Canada will be placed in direct communication with New York City.

Additions to manufacturing plants in New England include the following: Goetz Silk Company, Holyoke, Mass., new mill, 75 x 200 ft., four stories, with ell, to cost \$100,000; Carl Stohn, Clarendon Hills, Mass., textile mill at Hyde Park, Mass., to cost \$40,000; Orford Soap Company, Manchester, Conn., grinding plant mill, 35 x 50 ft., two stories, and large storehouse; De Surmont Worsted Company, Woonsocket, R. I., additional mill, 110 x 160 ft., four stories; Elm Refining Company, Stamford, Conn., additional factory; Hartford Builders' Finish Company, Hartford, Conn., addition 22 x 80 ft., two stories; Gaylord-Kendall Company, Chicopee, Mass., new building, to be rented for manufacturing purposes.

The Potter & Johnston Company, Pawtucket, R. I., builder of automatic chucking and turning machines and universal shapers, is rushed to the maximum capacity of its works and proposes to build a large extension this season, the details of which are not decided. The company owns a very large tract of land, which permits of unlimited growth on the ground floor, and this scheme will be carried out in the new building. The company has segregated its shaper department, so that the entire main plant will hereafter be given over to the automatics. When it is borne in mind that the capacity of the shops is twice what it was in 1907, the large volume of current business may be realized. There are more orders on the books than at any time during the last high wave of demand, when deliveries were many months in the future, and much business is being booked constantly.

The Potter & Johnston Company has brought out a new machine known as the 6A manufacturing automatic chucking and turning machine, which handles castings of all kinds up to 14 in. in diameter, the tool being a larger size of one which has been described in detail in *The Iron Age*. Already there is a large call for it.

The Whitney Mfg. Company, Hartford, Conn., manufacturer of chains, machinery and specialty, will erect immediately an addition to its plant which will increase the manufacturing space by 24,000 sq. ft. In the present buildings about 80,000 sq. ft. are available. The addition will be 60 x 80 ft. and five stories. When the factory was built in 1907 it was constructed to permit of extension, so that a homogeneous whole would result. The construction will be of reinforced concrete, with brickwork on the outside piers to continue the architectural scheme. The new part will eventually constitute the middle section and will be a story higher than the present building. The latter will be duplicated in the northern wing at some time in the future. The growth of this business has been an unusual one, the great factory occupied only three years being already entirely inadequate for its purposes. The construction of the addition will begin at an early date.

The business of the New Milford Foundry, New Milford, Conn., whose plant was destroyed by fire recently, has

been incorporated under Connecticut laws, with \$25,000 capital, as the New Milford Foundry & Machine Company. J. A. Northrop is president and superintendent, and Harry G. Northrop treasurer and secretary. Work on the new buildings is already under way. The machine shop will be 40 x 40 ft., two stories, and the foundry 34 x 60 ft. The company is in the market for a band saw for its pattern room, a blower and a core oven.

Plans are practically completed for the new foundry of the Deane Steam Pump Company branch of the International Steam Pump Company, Holyoke, Mass. The building will be of brick and steel, 150 x 290 ft., and 46 ft. high.

The business of the Powell Tool Company, Worcester, Mass., has been purchased by a new corporation known as the Powell Machine Company, Fitchburg, Mass., organized with a Massachusetts charter and capital stock of \$30,000. The new company will manufacture the Powell planer of both standard and accelerating speed drive type. A. M. Powell is the president of the corporation, M. A. Coolidge treasurer and Alric M. Powell secretary. The company states that it has a satisfactory amount of orders in hand and is prepared to make prompt deliveries.

The New Departure Mfg. Company, Bristol, Conn., is making important additions to its large plant. A new hardening shop has been constructed, 90 x 200 ft., and extensions have been made to other buildings, giving an additional floor space of 84,080 sq. ft. Extensions are made necessary by the rapidly increasing demand for the company's ball bearings, coaster brakes and bells. The company will also install in the near future its fourth high power gas engine.

The stockholders of the American Hardware Corporation, New Britain, Conn., are to vote on the recommendation of the Board of Directors to increase the capital stock from \$7,500,000 to \$12,500,000, by the addition of 50,000 shares at \$100 each. Of the new issue \$2,500,000 will be issued immediately, that amount to be transferred from the surplus to the capital account, and a 33 1/3 per cent. stock dividend declared. The balance of the new capital will be held in the treasury for future requirements.

The Boston & Maine Railroad announces that the continuation of the new repair shops at East Somerville, Mass., will be undertaken as soon as the business and financial condition of the company permits, which, under existing circumstances, should be at no distant date. The construction of the running repair shop is already well under way, as has been stated. Other buildings included in the \$2,000,000 scheme are a car repair shop 130 x 962 ft., a paint shop of about the same size, and buildings, large machine shops, pipe and tinsmith shops, nickel plating department, lacquering and upholstering shop, sash and blind shop, woodworking and cabinet shop and blacksmith shop. The buildings will cover 45 acres. A power house with large electric generating capacity will form a part of the establishment.

The interesting report comes from Connecticut that the New York, New Haven & Hartford Railroad will locate its repair shops for the western end of its system at Midway, near Noank, Conn., on the shores of the Poquonoc River. It is known that the company has plans for great shops somewhere in its western territory to duplicate, perhaps on an even larger scale, the plant at Readville, Mass., which takes care of the repairs of both locomotives and cars. However, nothing definite has been announced up to the present time.

An induction motor generator set of 100 to 120 kw., together with other apparatus, is to be provided shortly for the service system of the Bangor Railway & Electric Company, Bangor, Maine.

The Baush Machine Tool Company, Springfield, Mass., has sold its entire vertical boring and turning mill business to the Detrich & Harvey Mfg. Company of Baltimore, Md., who will hereafter manufacture this line of tools.

The Boston Belting Company, Boston, Mass., announces the termination of its arrangements with the Jewel Belting Company of Chicago, Ill., to act as its Western agent. The company has opened its own store at 177 Lake street, Chicago, with M. S. Curwen manager of sales. A complete assortment of rubber belting, hose, packing and other mechanical rubber goods will be carried in stock.

Cincinnati.

CINCINNATI, OHIO, April 12, 1910.

April so far has not been quite up to the expectations of the machinery and machine tool trade. The railroads have been slow in placing orders and many inquiries from general manufacturing plants for tools and equipment are still hanging fire. It is true that machine tool manufacturers are comparatively unconcerned about the lack of new business coming out, for the reason that they are still behind on deliveries. Milling machines and gear cutters are conspicuously hard to get. The automobile manufacturers continue to crowd the milling machine builders and deliveries on the medium sizes of this tool are from 60 to

90 days behind. Gear cutters seem to be in equal favor and the smaller sizes are not obtainable earlier than August, while deliveries on the larger sizes can be made as early as June or July. Lathes continue good sellers.

Foreign inquiry shows but little improvement. Dealers in second-hand machinery continue to report excellent business in types of special machinery, but a little slow in the standard machinery lines. One of the largest machinery supply houses in Cincinnati reports more business for the first 11 days in April than for the entire corresponding month in 1909. The demand is mainly for small tools and there is an especially heavy inquiry for friction clutches. One house reports one order to-day for 250 clutches for installation in a gas engine factory.

The new machine shop of the Cincinnati Car Company, Winton place, is about completed and much of the new equipment has been purchased and some of it delivered. The new department is 75 x 125 ft., and work on it is being rushed to permit of its occupancy and use at the earliest possible moment. The company has enough business booked to keep its entire force busy for several months, or until October. A late order is 100 cars for the Public Service Corporation, Newark, N. J., all to be of the double truck interurban type. Fifty additional cars of the "pay as you enter" type are under construction for the lines of the Cincinnati Traction Company.

The Board of Directors, University of Cincinnati, has awarded contracts involving \$255,000 for the construction of the new engineering building of the university, and the appropriation will permit of a fund of \$45,000 for equipment. Ground is to be broken within a few days and construction is to be rushed.

Christian Roos has purchased the brass foundry plant at 2129 Barnard street, formerly conducted by John Mainhardt in connection with an engraving enterprise. Mr. Meinhardt will continue the engraving business.

The Reliance Engineering Company, Cincinnati, is working on plans for new buildings for the Banner Grocers Baking Company, which will be located at Oak and Stanton avenues, Walnut Hills.

The Victor Lamp Company, Cincinnati, is moving into a new \$50,000 plant at Colerain avenue and Sassafras street, Camp Washington.

The Cincinnati offices of the American Radiator Company are to be enlarged and additional exhibition space provided. The company has taken the second floor of the Rawson Building, Fourth and Elm streets, where it will have its offices and exhibition rooms. The company moves from 213 West Fourth street.

The Western Ohio Fence Company is a new incorporation at Lima, Ohio, with a capital of \$35,000, for the manufacture and sale of iron fencing. The incorporators are E. V. Roberts, J. E. Johnston, C. F. Harsh, M. Meredith and L. V. Roberts.

The Kiltre Boiler & Tank Company, Canton, Ohio, has increased its capital stock from \$25,000 to \$50,000.

The Godfrey Gas Engine Starter Company has been incorporated at Oberlin, Ohio, by A. D. Booth, R. H. Avery, R. W. Godfrey, H. E. Arnold, C. T. Biggs. Capital stock, \$75,000.

John P. Arbenz, A. G. Hubbard, W. W. Simpson, G. H. Phillips and W. A. Shirley, all of Wheeling, W. Va., have incorporated the Riverside Sanitary Mfg. Company, with a capital of \$250,000, for the manufacture of metal and glass wares and pottery.

There is talk in Springfield, Ohio, of a combination of the leading piano plate manufacturers of the United States, with headquarters in that city, where the three largest—the Wickham, the Fairbanks and the O. S. Kelly—companies are located. The unofficial announcement includes a stove foundry of Cleveland and another unnamed firm as interested in the deal, with headquarters of the entire combination at Springfield.

Representative Edwards of the Ohio Assembly is pushing his resolution offered in behalf of improvement of State roads with slag. The United States Steel Corporation has offered the State all the slag it can use, and it is understood that the cost of transportation will be practically nothing. The corporation is willing to furnish the slag from its furnaces free because of the rapidity with which it is piling up in yards since the railroads have taken all they need for ballasting.

The Buckeye Steel Castings Company, Columbus, Ohio, is outlining plans for the erection of an additional building on its property. The new structure will be 150 x 300 ft. This company has booked enough business to keep every department busy many months.

Of the larger Columbus, Ohio, factories none has made greater records lately than the Kilbourne & Jacobs Mfg. Company. The shops are now being operated practically to capacity. The company expended something like \$400,000 in improvements during the period of depression in 1908 and 1909, and while all departments were on reduced time. The wisdom of that expenditure is now being made apparent. Much of

the appropriation for improvements was expended in the new car construction department, which has grown to be an important feature of the company's business. Orders for steel plantation and construction cars are especially heavy.

On April 8 fire destroyed the Rich Pump Works, Cincinnati, Ohio.

Cleveland.

CLEVELAND, OHIO, April 12, 1910.

Local machinery houses report the volume of business only fair, although there is some improvement over March. Orders in this territory are nearly all for single tools, and no inquiries of any size have developed this month. Orders from the automobile trade show an improvement, local agencies having booked some good business from this source in the Michigan district during the week. The demand for milling machines since the first of the year has not been as active as it was the latter part of 1909, and several manufacturers are able to promise better deliveries. There is an increasing demand for second-hand tools, which are rather scarce, and good second-hand tools are bringing high prices.

Among local machine tool builders and manufacturers in metal working lines the situation continues generally satisfactory. Builders of heavy handling and special machinery have their plants filled with work, with much more in prospect. Some good orders have been taken for water power installations. There are many inquiries from the West for mine hoists. The demand for industrial cars and locomotives continues good, but complaint is made that very low prices are being quoted by some manufacturers. Inquiries for electrical power equipment for large installations are at present rather scarce.

The foundry trade with the light shops continues satisfactory, but conditions among the heavy shops are unsettled because of the demands of the union molders and coremakers in these shops for higher wages, and the heavy foundries are not active in seeking new work. Some of the steel casting foundries are not as well filled with orders as they were earlier in the year.

The Farrell Castings Company, Sandusky, Ohio, will enlarge its plant by the erection of a foundry building, 100 x 100 ft. A 5-ton traveling crane, cupolas, blowers, motors and other equipment will be required, orders for which will be placed by the Osborn Engineering Company, Cleveland, the engineers in charge.

The Alkali Rubber Company, Akron, Ohio, will soon begin the erection of a large plant, plans for which are being prepared by the Osborn Engineering Company of Cleveland. There will be three buildings, and in addition a power plant. The buildings will be of reinforced concrete. The Bolton-Pratt Company, Cleveland, has been given the contract for the buildings. The Alkali Company will be in the market for machinery and power plant equipment.

The Lima Locomotive & Machine Company, Lima, Ohio, will enlarge its plant by the erection of a foundry, 130 x 180 ft., and a power plant, 130 x 150 ft. The buildings will be of steel frame and brick construction. Plans are being prepared by the Osborn Engineering Company, Cleveland. Equipment for both the foundry and power plant will be purchased soon.

The American Folding Machine Company, Cleveland, is in the market for a turret lathe, milling machine, drill press and small lathe.

The establishment of a municipal electric lighting plant in Sandusky, Ohio, in connection with the water works plant is under consideration by that city. The Ahlm-Zorn Engineering Company, Cleveland, has prepared an estimate of the equipment needed, including the following: Four 200-hp. water tube boilers; two 350-hp. engines of the slow speed, four-valve type; two 2200-volt 60-cycle alternating current generators, direct connected, including exciter, &c., condensers, pumps, switchboards, &c.

The Kurtzner Radiator Company, Cleveland, has been incorporated with a capital stock of \$10,000 to make radiators for automobiles. The company has temporary quarters at 416 Michigan avenue, Northwest. It intends to equip a plant. The incorporators are H. A. Kurtzner, F. W. Dunsford, G. M. Phillips, L. I. Letzler and W. F. Kees. H. P. Kurtzner is at the head of the company.

In addition to completing the plant of the Lake Shore Portland Cement Company, Sandusky, Ohio, which it recently acquired, it is announced that the People's Portland Cement Company of Sandusky will build a cement plant in Spokane, Wash., having a daily capacity of 2000 bbl. At a meeting of the company, held a few days ago, R. J. Kellogg, Cape Girardeau, Mo., was elected president; Arthur S. Ford, Chicago, Ill., secretary and treasurer, and C. L. Engels, Sandusky, vice-president and assistant secretary and treasurer.

The plant and equipment of the Milloy Mfg. Company, Wauseon, Ohio, builder of cranes, which recently went into the hands of receivers, will be sold at public auction April

24. The plant consists of a well equipped machine shop, foundry, &c.

The Alliance Machine Company, Alliance, Ohio, reports a very satisfactory volume of business. Since the first of the year the company's orders have kept fully up to its shipments.

The Godfrey Gas Engine Starter Company, Oberlin, Ohio, has been incorporated, with a capital stock of \$75,000, by A. D. Booth, H. H. Avery, R. W. Godfrey, H. E. Arnold and G. T. Biggs.

The National Acme Mfg. Company, Cleveland, reports a good steady demand for both its automatic screw machines as well as its screw machine products. The volume of orders received during March show an increase over February.

At the annual meeting of the stockholders of the Mount Vernon Bridge Company, Mount Vernon, Ohio, James Israel was elected president, J. M. Wolverton vice-president and chief engineer, and George Israel secretary and treasurer. The decision to rebuild the burned plant of the company at Mount Vernon was approved and the work will be rushed.

The Cleveland office of the Waterbury Farrel Foundry & Machine Company reports that with one exception the quarter ending March 31 was the best in the history of the office. Orders were pretty well divided among the various products of the company.

The Winton Motor Car Company, Cleveland, will erect a three-story brick and steel addition to its plant, 70 x 308 ft. The contract for the steel work has been let to the National Iron & Wire Company.

The Board of Directors of the Buckeye Steel Castings Company, Columbus, Ohio, has authorized the construction of an addition to the shipping department. The new building will be 175 x 300 ft., of heavy steel construction.

The Armor-Clad Mfg. Company, Canton, Ohio, is planning to add to its present products the manufacture of metallic office furniture, including card index and sectional filing cases.

It is reported that the Northern Ohio Traction & Light Company, which operates an extensive traction system in northern Ohio, has under consideration the erection of a large central power house, the site for which has not yet been selected. The company's headquarters are at Akron, Ohio.

The Fostoria Glass Specialty Company has broken ground at Niles, Ohio, for a large glass manufacturing plant.

The Warren City Tank & Boiler Company, Warren, Ohio, has completed plans for extensive improvements and desires to close a contract for a steel building. The company will be in the market for three electric traveling cranes, two hydraulic riveting machines and a hydraulic flanging machine and wishes to place orders for this equipment at once.

Pittsburgh.

PITTSBURGH, Pa., April 12, 1910.

There is an active market here at present for machinery of all kinds. At the shops of the several Westinghouse Companies orders for steam turbines, gas engines and electrical apparatus have recently been heavier than for some weeks past, and the individual units placed run to large sizes. One contract taken on the Pacific Coast calls for a turbine and generator of 18,000 kw. capacity operating at 1800 rev. per min. The fact that any builder of power machinery is willing to take the responsibility of turning out such machines, whose successful performance must be rigidly guaranteed, shows the present trend of design. In a class with this order are others accepted by manufacturers of the district for forging presses, shop tools, cranes, mill machinery and other equipment in sizes which would not long ago have been regarded as preposterous.

Industrial plants of various kinds continue to be the best customers of local dealers in machinery and supplies. New buildings and extensions for light manufacturing, as of shoes, textiles, household articles, small implements, brass and copper goods, hardware, &c., are taking in the aggregate an enormous quantity of equipment. Nearly all need boilers, engines, pumps, blowers, sprinklers, &c., and a large percentage is installing dynamos, motors and necessary apparatus for electric drive. Some buy current from local Edison companies and therefore need motors only; but, as steam boilers are usually required in the operation of a mill or factory, the owner ordinarily feels that economy dictates the installation of an entire power plant.

Great interest is being taken throughout the country in the possibilities of the low pressure steam turbine, which has been developed here to a more considerable extent, probably, than elsewhere in the world. Machines are now designed to utilize the exhaust steam not only from high pressure turbines and reciprocating steam engines, but also from

direct acting pumps, air compressors, heating systems and tanks used in various processes of manufacture. Furthermore, the plan is now being tried of running hot waste material, such as slag, into a closed vessel with water and thereby generating steam at low pressure for power purposes. In many parts of the West where fuel is costly the application of this idea will enable the mechanical operations of smelters to be carried on at very slight expense, particularly if the waste gases are also brought to combustion under a regenerator.

Plans for a shop building of considerable size have been prepared in behalf of the Pittsburgh Motor Vehicle Company, Pittsburgh. The details of such new equipment as will be needed have not been fully determined.

The Central Pennsylvania Light & Power Company, Clearfield, Pa., which is now operating Warren generators driven by Eric and McIntosh & Seymour engines, will install a new belted unit, bringing its total capacity up to 700 hp. Some auxiliary apparatus will also be required.

A boiler of about 125 hp., engine, generator and auxiliary equipment will be required by Harry Crisp, Elyria, Ohio, for a private power plant.

The extension to be made to the Canton Drop Forging & Mfg. Company's plant, Canton, Ohio, recently alluded to, will be 45 x 55 ft., and equipped with the best modern appliances.

An electric hoist and other machinery will be provided in the near future for one of the Borderland Coal Company's shafts at Borderland, about two miles from Nolan, W. Va.

A complete crushing plant, with breaker, elevator, screen and motive power, has been purchased by Joseph H. Ward's Son, Ridley Park, Pa.

The authorities of North Baltimore, Ohio, which is now served by the North Baltimore Water & Electric Company, are considering installation of a municipal power and lighting plant.

From Huntington, W. Va., it is reported that the American Car & Foundry Company has some large orders in the works there and is operating to full capacity.

A large outfit of machine tools and other apparatus for repair work will be required by the Kilpatrick French Automobile Company, Clarksville, Ohio, in connection with a new building to be erected shortly.

The Farris Bridge Company, Pittsburgh, has been awarded contract for the new steel structure which is to be built near Parkersburg, W. Va., over one of the tributaries of the Ohio River.

The Jones & Laughlin Steel Company recently placed an order with the Pittsburgh office of Laidlaw-Dunn-Gordon Company for nine air compressors, each of 1000 cu. ft. per minute capacity, to be installed at Fredericktown, Pa., for coal mining operations.

Construction of a municipal power plant equipped with steam turbines is under consideration at Crawfordsville, Ind., where preliminary plans have been submitted by a consulting engineer. The capacity proposed is understood to be about 750 kw. The city is now served by the Crawfordsville Electric Light & Power Company.

Local manufacturers of power and electrical machinery expect to bid shortly on the equipment of a new plant of 5000 kw. or over, to be erected by the Northern Ohio Traction & Light Company, Akron, Ohio, the plans for which are now being prepared.

The Landis Tool Company, Waynesboro, Pa., has been meeting with a large demand from the motor car industry for its new type of crank grinder, for which exceptional accuracy is claimed.

The Pittsburgh Railways Company is having plans drawn for new division car barns in Pittsburgh, which will be provided with a fully equipped machine shop and other appliances for repair work.

The Cecil Lumber Company, Elm Grove, W. Va., is preparing to install a planing mill, equipment for which will be required in the late spring or early summer.

The Hayden-Corbett Chair Company, Columbus, Ohio, will proceed shortly with the execution of plans to reconstruct for larger capacity the portion of its plant which was burned not long ago. Considerable new equipment will be provided.

It is reported in Pittsburgh, although without confirmation, that the Keystone Electric Light, Heat & Power Company, Gettysburg, Pa., which now has Erick boilers aggregating 600 hp., is in the market for two more of similar type of 200 hp. each. C. Taylor Leland, Land Title Building, Philadelphia, is secretary-treasurer.

The plants of the Union Drawn Steel Company and the Acme Keystone Company, Beaver Falls, Pa., were both badly damaged by fire April 9. The estimated loss to the two plants is over \$500,000.

L. F. Neuweiler & Son, Allentown, Pa., have purchased a site at that point on which they will erect a brewery. It is understood that the power plant equipment is yet to be arranged for.

The downtown offices of the Thomas Carlin's Sons Company, whose general offices and works are located on River avenue, N. S., Pittsburgh, Pa., are now located in rooms 1918-1919 Henry W. Oliver Building. The products

of this company are varied, consisting of shears, grinding pans, engines, boilers, pumps, hoisting engines, contractors' machinery, steam shovels, locomotives and rolling mill machinery. It is running its plant to full capacity.

Milwaukee.

MILWAUKEE, WIS., April 11, 1910.

Wisconsin manufacturers and dealers have been experiencing a fair demand, during the past week, for machine tools and other shop equipment; but no large orders are reported. Shipments appear to have been in excess of bookings. Buying for the account of metal working plants through the State continues heavy, as a whole, and there is considerably more to be expected for fall delivery, when many works extensions now under construction, or in prospect, will be placed in service.

Orders from the motor vehicle trade are not so frequent as they have been; but some of the smaller automobile and autotruck companies recently organized are in the market for equipment. A good many light tools, motors, compressors, &c., have also been sold recently to owners of repair shops, usually connected with garages. Secondhand apparatus is particularly wanted by such establishments, if in good condition, as the matter of operating economy does not affect this class of work.

In the line of general industrial machinery marketed, conditions continue very satisfactory. Wisconsin manufacturers are at present extremely conservative in booking orders. A visit recently made to representative plants in this section showed many of them so crowded with work that the aisles were blocked; and in some cases storage yards or sheds are full of castings waiting to be machined. Under the circumstances prices hold very firm, and manufacturers are not particular about entering upon new contracts except where they can do so on favorable terms. The stocks of material generally carried are quite large.

Machinery builders who do not operate foundries of their own have been somewhat at a disadvantage, for a number of months, owing to the difficulty of obtaining castings promptly as needed; but, with largely increased production on the part of jobbing plants, this condition is being remedied. Several new gray and malleable iron foundries are about to be established in this State; and one, at least, will be of very large size, so that by autumn the output of the State in this respect will probably be sufficient to take care of all local requirements.

A significant feature of the situation here is a large reduction which has taken place within the past five or six months, and particularly during the latter part of this period, in the number of traveling salesmen employed by the various machinery houses. In some cases this has been due to the fact that plants are working to their full capacity on orders for a long time ahead; but it is also indicative of a gradual change which has come about in methods of doing business. The customers of Wisconsin manufacturers are placing more contracts than ever, this year, on the basis of terms arranged directly by correspondence, as in the majority of cases they are already acquainted with the apparatus itself and do not need to be talked into buying it. What they are usually most concerned about is to secure prompt delivery; and they seldom haggle over the price if it appears to be reasonable. There is also a tendency on the part of the manufacturers of this section to depend more and more upon representation through reliable agencies and dealers; and in this way their effective sales territory has been materially widened. Distrust of dealers located at a distance, which was formerly quite prevalent here, is gradually disappearing, and the relations now maintained between both parties are almost invariably satisfactory.

E. N. Dickson, who resigned some months ago as vice-president and manager of the Milwaukee Coke & Gas Company, has organized the Dickson Malleable Iron Company, with a working capital of \$150,000. With him are associated Hugo A. Gutekunst, who is a practical metallurgist, and Willett W. Spooner, a son of former Senator Spooner. A large foundry will at once be erected on the Dickson farm in West Milwaukee, where it will be accessible to two railroads, and furnished with the most modern equipment. Prior to his connection with the Schlesinger interests, Mr. Dickson was general purchasing agent of Allis-Chalmers Company and has had experience in handling metal of every kind. He was also active in the management of the Northwestern Iron Company and Newport Mining Company.

The Burlington Brass Works, Burlington, Wis., is increasing its capital stock to \$250,000 and will provide for a much greater annual output.

The equipment of the Monitor Automobile Works, now located at Janesville, Wis., is being installed, having been

brought from Chicago, where it was formerly in service. New machinery will be added as the business develops.

A three-story addition, with enlargement of the present machinery layout, will be made to the factory of the Columbia Shoe Company. Electric motors are likely to be needed.

The Robert Rom Company, Milwaukee, has been awarded a large contract by the city to furnish gates and valves for water main replacements.

H. P. Hellmer, Platteville, Wis., has had plans drawn for a wagon factory, 50 x 70 ft., for which some new equipment will be required. Motor drive may be used, as electric current from the new power system centralized at Galena can now be purchased at relatively low cost. It is generated by the Interstate Light & Power Company.

Among the buildings to be erected this year by the Great Northern Railway at Allouez, near Superior, Wis., are a power house, roundhouse, coaling plant, gasoline tank, water tank, &c., involving the installation of considerable machinery and handling equipment.

Arrangements will probably be made to operate the handling equipment of the Pittsburg Coal, Dock & Wharf Company's new plant at Duluth on current supplied by the Great Northern Power Company of that city, whose hydroelectric station on the St. Louis River at Thomson, Minn., is capable of turning out 40,000 hp. continuously. A number of industries in Duluth and Superior are now being furnished with this power.

The Berlin Machine Company, Beloit, Wis., has been awarded contract for a large part of the machinery to be installed in the mills of the Kirby Lumber Company, Houston, Texas, which are to be built at Beaumont and Brownell, Texas. The remainder will be supplied by the American Woodworking Company, New York City. This is the largest order of the kind that has been placed anywhere in the country for some time past.

The Vilter Mfg. Company, Milwaukee, has recently been taking a large number of contracts for power and refrigerating machinery to be installed at various points in the Southwest, where the building of new plants is now particularly active.

The plans of the Wausau Street Railway Company, Wausau, Wis., for an additional hydroelectric plant at Mosinee, are practically decided upon, and the purchase of machinery may be considered this summer. Turbines heretofore installed have been of the Leffel and Allis-Chalmers types. The company has purchased flowage rights of sufficient capacity for the development of a head of 21 ft., which under normal conditions would yield 6000 hp.

The plant of C. Gotzian & Co., Eau Claire, Wis., will be enlarged and new machinery installed. The main offices of the company are at St. Paul, Minn.

The Nordberg Mfg. Company, Milwaukee, has been awarded contract for a pumping engine of 5,000,000 gal. daily capacity, crank and flywheel type, to be installed in the municipal water works at Phoenix, Ariz.

Considerable new machinery will be provided during the coming summer for the plant of the Ross Rubber Mfg. Company. Plans in detail to provide for the increased capacity needed have not yet, however, been fully determined upon. This company was formerly known as the Badger Rubber Mfg. Company.

The E. B. Hayes Machine Company, Oshkosh, Wis., has completed the installation of machinery in the new wood-working plant of the Hudson-Kelly Lumber Company, Hoquiam, Wash., erection of the buildings for which was finished April 1. This is one of the best equipped plants of its kind in the Northwest.

The Roe-Halverson Auto Company, Stoughton, Wis., is arranging to turn a local blacksmith shop, remodeled for that purpose, into a repair garage and will install suitable tools for the work.

Will J. Sando, manager of the pumping engine and hydraulic turbine departments of the Allis-Chalmers Company, has resigned to devote his time to consulting work in connection with large water plants and irrigation systems and to the interests of the Sando Engineering Company, of Boston, Mass., which was organized some time ago.

The Tennessee Coal, Iron & Railroad Company has ordered from local builders a 30 x 60 in. horizontal heavy duty Corliss engine, which is the fourth to be contracted for within the past two years.

The McDonough Mfg. Company, Eau Claire, Wis., has recently installed a double-cutting band mill, with 14-in. blade, in the remodeled mill of the Eureka Lumber Company, Eureka, Mont.

One or more pumping units will be required this year at Alma, Wis., where plans for city water works are now in course of preparation.

A news dispatch from Superior, Wis., states that the Zenith Furnace Company, Duluth, Minn., will extend its dock 600 ft. and install new loading machinery.

The project for a municipal pumping plant and water works system at Waterloo, Wis., has been approved. Bonds will be issued within a month or two and machinery purchased about June 15.

The Wehr Brothers, who have been connected with the Falk Company, Milwaukee, are proceeding with plans for the erection and equipment of a foundry; but no location appears to have thus far been selected, and the name under which they will operate is undecided.

It is reported from New Lisbon that the Mauston Electric Service Company, Mauston, Wis., will build a hydroelectric plant there, having purchased the water rights. This company now has a combined turbine and engine generating station of 200 kw. at Mauston.

All of the public utilities at Eau Claire, Wis., including the plant of the Chippewa Falls Water Works & Lighting Company, have passed under the control of the Chippewa Valley Railway Light and Power Company which will make extensive improvements in its equipment.

Guilbert & Funston, Robinson Building, Racine, Wis., are taking bids for an iron and wire factory 45 x 125 ft., three stories.

The Jacob J. Vollrath Company, Sheboygan, Wis., is erecting an enameled ware plant consisting of the following buildings: Warehouse, 220 x 378 ft., one story; enameling room, 150 x 252 ft., one story; mill, 80 x 115 ft., two stories; pickling house, 82 x 110 ft., one story.

The Willard-Harlow Mfg. Company, Janesville, Wis., which is contemplating the erection of a factory at Spring Brook, Wis., has elected the following officers: R. Willard, president; P. H. Korst, vice-president; J. C. Harlow, secretary; C. V. Kerch, treasurer. The company will manufacture spark plugs, boat canopies, awnings and a number of other specialties.

The Van Brunt Company, Horicon, Wis., has secured additional land and will erect a new factory, the main building of which will be 100 x 170 ft., three stories. There will also be another building 80 x 100 ft., which will be used as a blacksmith shop. The building now used as a blacksmith shop will be added to the foundry.

The Central West.

DES MOINES, IOWA, April 9, 1910.

Trade west of the Mississippi River continues on the upgrade, and the demand for machinery seems to come uniformly from all sections that are not given over purely to agricultural pursuits. No large industrial projects are in prospect, except as recently noted in this report; but an immense volume of improvement work has been inaugurated and it all involves increased equipment of one kind or another, as well as the purchase of building material, contractors' outfits, supplies, &c. There will also be more done this spring and summer than ever before in the way of building new electric interurban lines and extensions, erecting power houses, substations, &c., and providing boilers, engines, turbines, generators, &c., of greater capacity than units already in service. In each instance of this kind the accessory apparatus alone calls for relatively heavy expenditures and the upkeep creates still a further demand from one season to another. Dealers in this territory are doing the bulk of the business, except on large orders.

The F. D. Kees Mfg. Company, Beatrice, Neb., has let contracts for the addition to its hardware factory, which will be completed by mid-summer.

A pumping unit of moderate capacity will be purchased this spring for the water works at Fenton, Iowa.

A motor driven pump for deep well service is to be installed by the city of University Place, Neb.

The Iowa Mfg. Company, Oskaloosa, Iowa, has the contract for erecting a large steam plant in one of the Northwestern States and is reported to be in the market for a boiler and rotary pumps.

A pumping unit will be purchased in the near future for the proposed water works system at Caldwell, Idaho, where deep wells are to be driven.

From Grangeville, Idaho, it is reported that Walter H. Hill of that place is arranging to install a hydroelectric power unit on the Clearwater River. The machinery has not yet been provided.

Construction of a municipal station for power and lighting is proposed at Monroe, Utah.

The Silver Bros. Iron Works Company, Salt Lake City, Utah, was low bidder on a dredge to be built for the municipality, but the Marion Steam Shovel Company, Marion, Ohio, was awarded the contract on the basis of quick delivery.

The Dillon-Box Iron Works, Denver, Colo., is putting on the market a machine for framing mine timbers which renders very efficient work.

Neumann Bros., Seward, Neb., will install an electric generating set of 50 kw. or over some time this year.

The plant of the Hassell Iron Works, Colorado Springs, Colo., which was burned on April 1, will be rebuilt as soon as the wreckage can be cleared away.

Detroit.

DETROIT, MICH., April 12, 1910.

Business here continues about the same as it has been, but manufacturing conditions are steadily improving and the volume of production shows an appreciable gain over what it was three or four months back. It is claimed, and not without reason, that in no industrial section of the United States are terms of contracts being so closely met as hereabouts. Machine tool builders, as well as shop and foundry outfitters generally, can now take considerable business for reasonably deferred delivery; but few of them have any need to go out after orders, as there is a steady run of inquiries, mainly from old customers. Selling expense during the present season has been so largely reduced as to make up much of the burden of the long period of depression. For some months past this has been a manufacturer's market, rather than a dealer's; but agreements with the latter are, in most cases, being faithfully kept by machinery builders, and the favorable conditions now existing are shared by both.

Special machinery is called for at present to a considerable extent, and tools which are sufficiently automatic to enable a group of them to be tended by one operative find ready sale in a variety of industries, particularly to shops engaged in the production of automobile parts, brass fittings, hardware, plumbers' supplies, &c.

Manufacturers in the western part of Michigan who make a specialty of woodworking machinery have had all they could do this season to supply the demand from pattern shops, furniture factories, interior finishing establishments, sash and door factories, flooring mills, &c., and there does not seem to be any prospect that the needs of this trade will diminish for a good many months to come. Inquiries from the near and far Northwest are especially liberal in volume, but thus far Wisconsin and Minnesota manufacturers seem to have had the bulk of the orders. The movement from this section has been mainly to the South and East, and it is sufficiently large to take all offerings.

Plans for the additions to be made to the Wolverine Brass Works, Grand Rapids, Mich., have been practically completed, and the matter of erection and equipment is now receiving attention.

The Evansville Gas & Electric Light Company, Evansville, Ind., which is equipped with General Electric generators of 2500 kw., driven by Corliss engines, has determined upon the addition to its plant of a horizontal steam turbine and dynamo of 1500 kw., direct connected, with auxiliary apparatus, including condenser. The contract is believed locally to have been already let.

The Stoddard-Dayton Company is planning to enlarge its manufacturing facilities at Dayton, Ohio, and considerable new machinery, electrically operated, will be installed in the fall. Additional buildings are also under consideration.

A new crushing outfit, with gyrating breaker, elevator, screens, &c., will be installed this spring by James N. Blair, Bloomington, Ind., who has heretofore operated a jaw crusher plant.

The Grote Mfg. Company, Evansville, Ind., has bought a new site there and will erect a factory of much greater capacity than that now occupied by them. Quite a line of power apparatus, shop tools and other equipment will be needed.

North & Bradshaw, Jackson, Mich., have contracts for a large addition to be made to one of the factories there. Particulars in relation to structure and equipment can be learned through them.

Power and wood working machinery will be required by the Escanaba Lumber Company, Escanaba, Mich., in equipping a new flooring factory at Masonville, Mich., plans for which are now under way.

A foundry addition 100 x 140 ft. will be built this spring at Kalamazoo, Mich., by the Kalamazoo Stove Company. A boiler of 300 hp. will be among the requirements of the plant necessitated by the enlargement.

Contracts for the erection and equipment of an addition to its factory are being let by the World Star Knitting Company, Bay City, Mich. Motor drive will be introduced.

The Fox Machine Company, Grand Rapids, Mich., has made a number of good sales of multiple drills to shops supplying small parts for the automobile trade, where apparatus of this kind can be used to particularly good advantage.

The Toledo Railways & Light Company, Toledo, Ohio, has decided upon the installation of a steam turbine generating unit of 500 kw. and other machinery to provide for an increase in generating capacity. Power transformers will also be needed.

Plans have been drawn for a new four-story factory, 60 x 130 ft., to be erected by the Detroit Show Case Company. The machinery will be motor driven.

The Ohio & Michigan Stone & Gravel Company, Toledo, Ohio, will add to its crushing plant equipment, including the installation of a 12-ft. rotary screen.

The addition to be made during the coming summer to the plant of the Northway Motor & Mfg. Company, Detroit, will triple its capacity. There are to be four buildings, one 90 x 225 ft., two 60 x 175 ft. and one 75 x 150 ft. Motor drive will be applied throughout.

A new two-story factory, 50 x 170 ft., motor driven throughout, will be erected in Indianapolis by the D. V. Reedy Elevator Company.

Contract for the steam generating equipment of the new plant of E. Raub & Son, Indianapolis, Ind., has been let to the Atlas Engine Works of that place.

The three factory buildings to be erected by the Brush Runabout Company in Detroit, this spring, will be 130 ft. wide and about 150 ft. long, all electrically operated.

The Northern Engineering Works, Detroit, reports among recent shipments and installations of Newton cupolas one 6-ton hourly capacity to Franklin Foundry, Columbus; one 10-ton to Cuba; one 8-ton to Holyoke Motor Foundry; one 6-ton to American Well Works; one 5-ton to Towers & Sullivan Company; one 4-ton to Birmingham Car & Foundry Company, and to Jackson & Church Company, and one 6-ton to J. B. Foote Company.

The foundry of the Roe Stephen Mfg. Company, Detroit, Mich., which was recently destroyed by fire, will be rebuilt as soon as plans can be prepared.

The Dowagiac Motor Car Company, Dowagiac, Mich., will move its factory during the latter part of May to Tulsa, Okla., where it will be known as the Tulsa Automobile & Mfg. Company. The company is having new factory buildings erected at Tulsa of larger size than those now occupied at Dowagiac.

The Warren Motor Car Company, Detroit, which is erecting a new plant, expects to have the first building, 60 x 600 ft., finished within 60 days. Another building, 60 x 400 ft., to be used as a paint and finishing shop, is scheduled to be completed September 1, and a third building, which will be used for assembling, will be ready January 1.

Baxter & O'Dell, architects, 1024 Hammond Building, Detroit, Mich., are taking figures for the erection of factory buildings for the Brush Runabout Company.

The South.

NASHVILLE, TENN., April 11, 1910.

The development of the mineral resources of the South, coupled with their utilization in the various industries, gives greater support to the machinery market at the present time than any other single factor, particularly as it carries with it much of the activity in power and pumping equipment previously noted. Not only iron and coal mining and the production of steel, but also the working of other mineral deposits, clay beds, phosphate rock, &c., call for a great deal of modern machinery. The last named has been particularly prominent of late, owing to the quantity of improved equipment needed and the fact that electric plants for power and lighting, driven in most instances by oil or gas engines, are being installed. This is largely because the industry has settled down to a practical working basis, by means of which the land and river pebbles are being systematically recovered and their phosphate values extracted. Formerly the richer deposits only were taken, but now the lower grades are being mined at the same time, and the reduction that has been brought about in the formerly excessive operating costs enables this to be profitably done.

As an object lesson of what the New South stands for industrially, the example just cited is impressive, for the reason that substantially the same thing has recently been accomplished along other lines of mineral exploitation.

The railroads forming branches of the trunk lines are also confronted with the necessity of a better maintenance of rolling stock and motive power. Hence quite a number of repair shops have been recently provided for, and they will need a good many tools. Buying on this account will, however, be gradual.

The Union Iron Works plant, Selma, Ala., has been put in shape this year for an output considerably greater than heretofore, and orders for engines of its build are already taxing the enlarged facilities.

Motor or gasoline engine driven pumps for sewage service will be required at Reidsville, N. C., if the present plan to construct a new sanitary system is put through. Electrically operated units will probably be selected, as current from the municipal power plant is available. Three pump houses are to be built.

Interests identified with the Russell Mfg. Company, Alexander City, Ala., may be in the market this summer for

a hydraulic turbine, governor, generator, exciter unit, transformers, switchboard, protective apparatus, line material, &c., as the construction of a hydroelectric plant a few miles distant from Alexander City is under consideration.

An elevated steel tank of large capacity, probably 150,000 gal., will be required in the near future for the municipal water system at Quitman, Ga. The contract has not yet been let.

A new foundry to be completed this spring by the Fulton Foundry & Machine Works, Atlanta, Ga., will give them largely increased capacity. A continuous melting cupola furnace is to be installed.

The Charlotte Pipe & Foundry Company, Charlotte, N. C., has been operating its new plant long enough to ascertain that a very large demand exists for material such as it manufactures.

Large orders for dump cars to be used in mining operations, for one reduction plant, smelters, &c., have been taken this season by the Peacock Iron Works, Selma, Ala., which is gradually extending its manufacturing facilities.

The Nashville Commercial Club, Nashville, Tenn., is endeavoring to secure the location there of a new wagon factory, with excellent prospects of success.

The Rome Railway & Light Company, Rome, Ga., is planning to enlarge its power plant, which was originally equipped with General Electric steam turbines and alternating current generators of 1000 kw. A 750-kw. unit will be purchased.

Among the busiest of Southern plants is the Schofield Iron Works, Macon, Ga., which makes a specialty of boilers, engines, stacks and operating machinery for mills of various kinds. This year there has been considerable trade with Cuba, Jamaica and Porto Rico.

The Johnson Chair Company, Morristown, Tenn., will build a factory considerably larger than it now occupies and equipped with the most modern machinery. Electric power may be used.

Phillips & Mahoney, Portsmouth, Va., are preparing to erect a new mill equipped with power and operating machinery of the most modern construction.

The authorities at Hartsells, Ala., have entrusted a consulting engineer with the preparation of plans for a pumping station and system of municipal water works.

Plans for a municipal pumping plant and water works system are under consideration at Concord, N. C., and contracts for machinery will be placed as soon as the work is authorized.

The Eppinger & Russell Company, which has extensive treating works for timber at Jacksonville, Fla., has ordered a new impregnating cylinder which will be 7 ft. in diameter and 132 ft. long. Two of similar construction have previously been installed.

The Virginia Railway & Power Company will shortly let contracts for the construction of car barns, blacksmith shop, paint shop, boiler room and other structures at Manchester, Va., which will involve the expenditure of \$600,000. The erection of the buildings will be under the direction of C. B. Buchanan and Calvin Whiteley of the company's engineering department, and it is stated that the construction work will probably be let to local contractors.

The Seneca Light & Power Company, Seneca, S. C., proposes to erect a power plant on Conneross Creek, three miles south of Seneca. The company was recently incorporated with a capital stock of \$50,000, and it expects to furnish power for manufacturing plants in Seneca. There is about 60 ft. fall of stream at the point where the plant will be built, and the company expects to generate about 500 to 700 hp. They will shortly be in the market for electrical equipment, water wheels and other hydraulic electric power producing apparatus.

A full equipment of machine tools for overhauling and repairing automobiles will be required by the Fairchilds Auto Company, 840 Baronne street, New Orleans, La. The company will erect a building, 119 x 160 ft., two stories. Part of the ground floor will be given over to the main office and sales rooms, while the upper story will be used as a general machine shop. The power equipment has been provided for.

The Northwest.

MINNEAPOLIS, MINN., April 11, 1910.

Reports of business done during the past week are somewhat conflicting. In the main they are favorable, but local option contests held at a number of points appear to have interfered with the placing of many orders in the sections involved, and there is in other directions a feeling of unrest which reacts upon trade. Political discontent is a factor which must be taken into account for at least some time to come. Material conditions are, however, forcing a steady industrial development which will not be stayed, and the machinery market west to the Coast as well as around the head of the Lakes is becoming established upon a firm basis. More Eastern houses are seeking representation in

this territory than during any previous time, and the number of local metal working plants now in operation is considerably greater than three years ago. All are busy and many have recently been planning or at work on extensions. A feature of trade at the present time is the extent to which the larger concerns at Duluth, St. Paul and Minneapolis have been reaching out into the Southwest, as well as the Northwest, for orders of various kinds, thereby invading territory which has heretofore been almost exclusively occupied by manufacturers and dealers located at such centers of production and distribution as Pittsburgh, Chicago, Kansas City, Denver, Salt Lake City and El Paso. This is one of the numerous indications marking the transition of the manufacturing industries of Minnesota from the home market stage to that of competition for business in all parts of the country, and by the end of the present season it will be much more pronounced.

The opening of navigation on Lake Superior is being preceded by an almost feverish activity, and industries in no wise concerned with the movement of ore have been affected by it, so that installation of new machinery has, of late, been everywhere pushed. Repair work is at a premium. Second hand equipment continues to be largely utilized, and it brings relatively good prices in the market as compared with new. Stocks of implements of all kinds have also been rapidly diminishing and in some localities temporary shortages are reported.

Funds have been provided for the construction of an electric power plant to be operated by the city of Owatonna, Minn., and bids on machinery will be called for shortly.

An electric generating unit will be required by the Rapid City Electric & Gas Light Company, Rapid City, S. D.

The National Iron Company, Duluth, Minn., is meeting with an excellent demand this season for mining, quarrying and contractors' machinery. Hoists, especially, are being used in development work to a greater extent than usual.

Stacks, boilers, tanks and sheet iron work of all kinds are needed at many points in the iron ranges, and the shops in this section have all they can do to keep up with orders. Among the busiest is the Dacey plant at Duluth, Minn., known as the Gogebic Boiler Works.

From Stillwater, Minn., it is reported, but without confirmation, that the Universal Tractor Company will locate a factory there; the present address of the company is given as Crookston, Minn.

The Sioux Falls Light & Power Company, which now operates a station equipped with three vertical shaft hydraulic turbines driving alternating current generators having a combined rating of 1500 kw., will probably duplicate this apparatus with a steam or gas power plant. Definite information can be obtained in due course from the company's consulting engineers, who were formerly, and are still understood here to be the H. M. Bylesby Company, Chicago.

A complete fire protection system, consisting of an elevated steel water reservoir, high pressure pump, sprinklers, &c., will be provided for the C. S. Christensen Company's plant at Madelia, Minn. Contracts have just been let for the major portion of the equipment.

The municipal officials at Philip, S. D., have ordered plans drawn for a pumping plant and water distribution system, the equipment of which will be considered about June 1.

Construction of a pumping plant to be operated by the city is under consideration at Medina, N. D.

The Northern Heating & Electric Company, St. Paul, Minn., will add to its service plant a motor-generator set of 100 kw. capacity on normal load.

The Valentine Mfg. Company and the Shock & Hay loader Company, Minneapolis, Minn., will consolidate under the name of Imperial Mfg. Company and erect a new factory 80 x 200 ft.

The Southwest.

KANSAS CITY, Mo., April 11, 1910.

It has been remarked by representatives of a number of large machinery houses who travel extensively through the Southwest, that one of the things which impresses them most, this year, is the amount of business being done by foundries, machine shops, boiler shops, fabricating plants and factories turning out metal specialties of different sorts in the small centers of population. Among these establishments new building is constantly going on and their equipment has been enlarged to an extent which would hardly have seemed possible some months ago. As a consequence, however, Kansas City, Dallas, El Paso and other cities have gained in importance as distributing centers for machinery, tools and supplies of every description used in the metal working industries; and the greater availability of raw materials, fuel, &c., over a few years ago, coupled with the natural advantage of freight rates, is encouraging the

location of many new plants of considerable size for supplying this trade direct.

All through the Southwest a very lively interest is being manifested in the utilization of the rivers for carrying heavy freight, the practical working out of which will be of very considerable benefit to all manufacturers and fabricators located along the principal waterways. The raising of the \$1,250,000 fund for establishing a line of steamers to ply on the Missouri River is intended only as a start in this direction.

Trade as a whole has been fair of late; but there are no features of special significance beyond those previously noted. Inquiries, however, develop into orders rather more quickly than they did during February and the first three weeks of March, indicating a livelier tone to the market.

The Western Valve Company, Chicago, Ill., has taken an order, through its Kansas City office, for valves and hydrants to be used along 10 miles of water mains at Sabetha, Kan., where new water works will be constructed during the summer.

A new electric generating station equipped with modern power units, probably steam turbines, will be erected this year by the Citizens Railway & Light Company, Fort Worth, Texas. Plans in detail, however, have not yet been made.

A Corliss engine of about 500 hp., similar to the one already in service, will be provided this summer for the Canadian Milling Company's plant at El Reno, Okla., which is one of a number operated by the same interests in that vicinity.

New boiler shops will be erected by the International & Great Northern Railroad, and other facilities for repair works provided at San Antonio, Texas, if present plans are carried into effect.

C. K. Jacobs, Columbia Building, St. Louis, Mo., has prepared plans for a large briquetting plant, for which considerable power equipment, crushers, pulverizers, mixers, pressers, conveyors, &c., will be required. Contract for erection is said to have been awarded the Jenkins Construction Company.

Funds are expected to be available shortly for the construction of a municipal power and lighting station at Fairview, Kan., and bids on machinery will be called for this spring or early in the summer.

A shop 45 x 100 ft., four stories, will be erected on the corner of Main and Spruce streets, St. Louis, Mo., by the John Ramming Machine Company, engine builders, who are now located at 300 South Main street. Among the requirements of the new plant will be power equipment.

Specifications covering machinery for the pumping plant to be constructed at Yukon, Okla., will soon be completed and bids taken.

Boilers, an engine driven electric unit and pumps for both power house and general water service, will be required by the West Helena Water Company, Helena, Ark., for a public service plant. The company was recently organized, with \$100,000 capital, by E. C. and J. E. Horner.

The J. S. Worley Company, Kansas City, Mo., has been intrusted with the preparation of plans for municipal service plants at Scandia and Stafford, Kan., for which power and pumping machinery will be needed in due course.

An electric unit for city lighting is required by Mountain View, Okla.

The Lipscomb Electric Company, Dallas, Texas, is making a specialty of equipping industrial plants in various parts of the Southwest with electric generating units for power and lighting systems.

The Pine Bluff Iron Works, Pine Bluff, Ark., has thus far had a very busy season, and the prospects for some time in the future are excellent.

Plans for the new plant of the Lee-Wilson Company, Wilson, Ark., include a complete fire protection system, with automatic sprinklers.

Construction of a municipal power and pumping station has been authorized at Stafford, Kan. Lighting service is now furnished from a 750 kw. electric plant maintained by the Larabee Flour Mills Company, in which engine driven alternating current generators are installed.

The Frank Eller Company, Houston, Tex., will erect a new factory building 100 x 100 ft., as an addition to its wagon works. All machinery is to be electrically driven.

The John Nooter Boiler Works Company, St. Louis, Mo., is preparing to erect a modern plant for the manufacture of boilers, tanks, stacks, &c., on a largely increased scale. The machinery, which has been partly contracted for, will be motor driven.

The Witte Iron Works Company, Kansas City, is doing a large business this season in gas and oil engines of its manufacture, which are being extensively introduced through the agricultural districts as well as in industrial communities.

The United States Portland Cement Company, Yocemento, Kan., is arranging to install a number of variable speed motors for driving machinery in its plant. Some of the new apparatus required has recently been purchased.

One or more small pumping units will be needed for

water service at Moore, Okla., where the construction of a suitable municipal plant has been authorized.

The Fort Scott Gas & Electric Company, Fort Scott, Kan., which is now operating a power plant of 400 kw. capacity, plans an enlargement of it. A steam turbine or producer gas unit may be installed.

A modern high duty pumping plant will be built this summer at Stigler, Okla. Funds have been provided and bids on machinery will be taken in the near future.

Machinery for an electric power and lighting station will be required shortly at Wetumka, Okla., where the necessary bond issue has been voted.

Pumps of moderate capacity, to distribute water from wells, will be needed this summer by the city of Marked Tree, Ark.

Plans for the plant to be built at Tucson, Ariz., by the recently organized Tucson Iron Works, are practically complete, and equipment will be purchased this month or next.

Pumps for circulating water will be required in the near future at Holland, Texas, by the Holland Water Company, recently organized. Details of equipment will not be decided upon until the rate of flow from artesian wells has been determined.

Mexican Notes.

A modern cyanide plant using American built machinery will be installed near Marfil, Guanajuato, Mexico, by La Tula Mining Company of New York City.

Electric drive has recently been introduced by the Parral Consolidated Mines Company, Parral, Chihuahua, Mexico, and more motors will be needed later on as operations are extended.

Barker & Empson, Pachuca, Hidalgo, Mexico, engineers in charge of the new stamp and cyanide mill being erected for La Blanca y Anexas, have placed the contract for a large part of the machinery. This includes a complete crushing and sampling plant and steel ore bins, &c.

The Pacific Coast.

SEATTLE, WASH., April 8, 1910.

The machinery trade, with all of its many ramifications, continues excellent, and there is a firm undertone to the market, which augurs well for the future. Prices hold firm, with advancing tendency, both for new and second-hand tools. Along some lines there is considerable scarcity of each. The good roads movement, which is being urged in the more populous sections all along the Coast, together with the need of ballast for steam and electric lines, has developed a large demand for crushing and screening apparatus. Representatives of Eastern manufacturers have been active in cultivating this trade, which also calls for gasoline engines, motors, elevators, conveyors, shafting, belting, &c. In the more remote districts portable crushing plants can be sold to advantage, and the traction lines are using outfits mounted on flat cars. Quarry equipments are also being strengthened, with increasing tendency toward steam shovel work, and the employment of heavy rolls or large gyratory breakers to avoid hand sledging.

Orders for the equipment of new mills and factories do not show quite as much strength as was expected at this time, in view of the construction work now under way, but the placing of contracts is only temporarily delayed, and during the coming month there will be a great deal of machinery wanted in a hurry.

Despite the prediction freely made last year that the cement mills built just prior to the panic would oversupply the Pacific Coast for a number of seasons to come, several huge plants have recently been started and more are in prospect, together with additions to those already operated. Concrete construction, which also carries with it a heavy demand for structural steel, is reaching proportions beyond all expectations, and the exceptionally good grades of cement now produced at plants in Washington, California, Idaho and Utah are crowding out foreign brands, even those of the very best quality. In equipment these plants, which are all motor driven, surpass those of any other section, as they represent the best skill available in modern industrial engineering.

The Multnomah Iron Works, Portland, Ore., have been doing a continuously large business this season, trade having been good even during the weeks of February, which were rather dull for most concerns. Power set works sold particularly well.

The American Pile Driving Company, Everett, Wash., has taken the contract for a large steel bridge over the Snohomish River at Snohomish, Wash., in competition with quite a number of bridge and structural steel companies.

The Puyallup Veneer & Mill Company, Puyallup, Wash., has completed a new plant equipped with machinery of the latest pattern, all electrically operated. A generating set

of 100 kw. capacity, with line of motors, has been installed.

A Corliss engine of 400 hp., for belting to line shaft, will be installed by the Simpson Lumber Company, North Bend, Ore., in a new plant which it is building.

By the installation of new equipment, including forge, machine and boiler shop tools, the car and locomotive repair shops of the Seattle, Renton & Southern Railway at Columbia Station, Wash., will be among the best in the country, and further improvements are to be made later.

The Washington Machinery & Supply Company, Spokane, Wash., is selling a good many hoists, both first motion and geared, to mining companies, which are very active at the present time in opening up new shafts.

A twin horizontal turbine, direct connected to a cycloidal pump, will be added to the plant of the Burbank Power & Water Company, Burbank, Wash. The contract has already been let.

The Bandon Light & Power Company, Bandon, Ore., which some time ago installed a General Electric Company's generator of 75 kw. to furnish alternating current, is taking steps to enlarge the capacity of its plant.

It is reported from Forest Grove, Ore., that the Haines Power Company will, upon the granting of additional franchise rights by the city, install a new engine driven generating unit.

The Philbrick Cutter Head Company, Seattle, has disposed of a large output of woodworking plants within the past few months, and additional manufacturing facilities have had to be provided. More will be needed as the year lengthens.

The Clark County Iron Works, which has established a general custom plant at Vancouver, Wash., is having all that it can do to keep up with orders for repair work, as mills and other industrial plants find it necessary to keep their equipment in condition for maximum production.

Interests identified with the Hefernan Engine Works, Seattle, will erect a large plant for marine work, including pattern shop and foundry, machine shops, joiner shop, ship-house, cranes, &c. Equipment details will be decided later.

A Westinghouse steam turbine of 1500 hp., with alternating current generator, inclosed type, direct coupled, has been ordered by the Union Lumber Company, San Francisco, for its mill at Fort Bragg, the one at Grass Valley being similarly provided for. Motor drive will be used on the machinery.

T. S. Hamilton, who is now in business at Bellingham, Wash., will erect a furniture factory there, equipped with woodworking machinery, motors and probably a power plant.

The Trent Engineering Company, Los Angeles, has taken a large order for concentrating machinery, to be installed in Nicaragua by El Vesuvio Mining & Development Company.

The Brown Electric Company, Wenatchee, Wash., in which Chas. F. Brown, secretary of the Wenatchee Electric Company, is reported to be interested, will shortly begin construction of a 5000-hp. hydroelectric plant on the Entiat River.

Several motors are to be provided this spring by the Glazed Cement Sewer Pipe Company, Aberdeen, Wash., for operating machinery at its works.

A new hydroelectric plant of 25,000 hp., to supplement the work of one recently installed, which is on a much smaller scale, will be erected by the San Joaquin Light & Power Company, Fresno, Cal., on the San Joaquin River, near that city, the plan being to distribute current over a territory embracing Madera, Fowler, Hanford, Selma, Coalinga, &c. Thus far the hydraulic turbines used by the company have been of the Doble and Pelton impulse types driving General Electric generators. Machinery will not be needed until construction work on the dam and power house is well under way.

An elevated steel tower of 100,000-gal. capacity, of special construction, will be required in the near future by the city of Seattle.

Government Purchases.

WASHINGTON, D. C., April 11, 1910.

The Paymaster-General, Navy Department, Washington, will open bids April 26 under schedule 2360 for three motors.

The Bureau of Supplies and Accounts, Navy Department, Washington, under schedule 2395, will open bids May 10 for 19 induction motors.

The Isthmian Canal Commission, Washington, opened the following bids March 30 for furnishing one motor driven centrifugal pump:

Blackall & Baldwin Company, New York, \$985 and \$890; De Laval Steam Turbine Company, Trenton, N. J., \$1065 and \$925; D'Olier Engineering Company, Philadelphia, Pa., \$1118, \$1280, \$1050 and \$1100; Janesville Iron Works Company, Washington, D. C., \$1075; Manning, Maxwell & Moore, New York, \$1172; Vermilye & Power, New York, \$895.

The Bureau of Supplies and Accounts, Navy Department, Washington, opened bids April 5 for the following:

Class 45. Eight ventilating fans—Bidder 4, American Blower Company, \$3750; 33, Diehl Mfg. Company, Elizabethport, N. J., \$3093.84; 49, General Electric Company, Schenectady, N. Y., \$2800; 64, Hig Electric Ventilating Company, Chicago, Ill.,

\$2636; 115, B. F. Sturtevant Company, Hyde Park, Mass., \$2474.

Class 131. Four motors—Bidder 5, Allis-Chalmers Company, Milwaukee, Wis., \$1203 and \$1166; 48, Fairbanks, Morse & Co., New York, \$1408.30; 63, Ideal Electric & Mfg. Company, Mansfield, Ohio, \$1280; 104, Reliance Electric & Engineering Company, Cleveland, Ohio, \$1429; 128, Westinghouse Electric & Mfg. Company, Baltimore, Md., \$1273.92; 133, Wagner Electric Mfg. Company, St. Louis, Mo., \$1418.22.

The Isthmian Canal Commission opened bids April 5 for the following:

Class 2. Two duplex boiler feed pumps—Bidder 37, Fox Brothers & Co., New York, \$528; 38, Gardner Governor Company, Quincy, Ill., \$530; 57, Manning, Maxwell & Moore, New York, \$493.60; 71, National Electrical Supply Company, Washington, D. C., \$539.70; 81, Platt Iron Works Company, Dayton, Ohio, \$514; 88, Scranton Steam Pump Company, Scranton, Pa., \$770; 97, Vermilye & Power, New York, \$479; 101, Henry R. Worthington, New York, \$685 and \$627.70.

The Riverside Engine Company's Operations.

The Riverside Engine Company, Oil City, Pa., is operating its plant to capacity and contracts in hand will permit continued operation for four months. It is now assembling three 15 x 17 in. double-acting horizontal heavy duty tandem natural gas engines for the Fairmont, W. Va., plant of the Owens Bottle Company, Toledo, Ohio. These engines will be direct connected to 60kw. Westinghouse generators, and each engine will also have an air cylinder directly attached to it with a capacity of 1000 ft. of free air per minute on 40 lb. pressure, which air will be used in connection with bottle blowing machinery. The same company is also having built a 15 x 17 in. horizontal heavy duty double tandem natural gas engine for direct connection to a 100-kw. Westinghouse generator. One of these engines is now on test and will be shipped out shortly.

The Riverside Engine Company recently made a shipment to the Standard Oilcloth Company, New York, of three 15 x 16 in. double acting gas engines that will be operated on producer gas. It is now building a 17 x 20 in. double acting engine for direct connection to a 150-kw. generator. This also has an air cylinder attached to it and will be a duplicate of the one furnished last year to J. B. Clow & Sons, Chicago, for their Coshocton, Ohio, plant, to be operated on producer gas. The first installation proved very successful; the use of producer gas brought the operating cost down about one-third of the cost shown by a steam plant of the same power. A 600-hp. unit is now nearing completion and will soon be shipped to the Philadelphia Rapid Transit Company, Philadelphia, Pa., where it will drive a railroad generator. The Riverside Engine Company has been quite successful with its gas engines in the oil pumping territory and the operators are well pleased with the installations, according to reports made to the builder.

The Stark Rolling Mill Company, Canton, Ohio, states that its output of black and galvanized sheets, blue annealed sheets and Toncan metal sheets for the first quarter of 1910 was the largest in any one month in its history. The demand for Toncan metal sheets is particularly heavy. The company has just completed some large roofing orders, among which were contracts for the Ford Motor Company, Detroit; M. A. Hanna & Co., Cleveland, and Standard Sanitary Mfg. Company, Pittsburgh. It expects shortly to put on additional mills to turn out Toncan metal sheets, as the present output is not large enough to meet the steadily increasing demand.

The Winona Technical Institute, Indianapolis, Ind., is proceeding to the completion of its year's work, in charge of the receiver, ex-Mayor Charles A. Bookwalter, the court having authorized \$20,000 in receiver's certificates. The purpose of the receiver and of those most interested in this promising trade school is to give fresh impetus to the work of the institute and make it larger and better than ever.

New Publications.

The Copper Handbook. By Horace J. Stevens, Houghton, Mich. Bound in cloth. Size, 6 x 9 in.; pages, 1628. Price, \$5. Sold by the author and sent for payment on approval after a week's inspection.

This is the ninth annual edition of a work which has become a standard authority in its line. The new edition lists and describes no less than 7751 copper mines and copper mining companies in all parts of the world, the descriptions ranging from two or three lines in the case of companies that have died recently to 16 pages in the case of one of the largest mines. As compared with the preceding volume, upward of 800 new titles have been added, covering descriptions not contained in any previous edition. The chapter of statistics, containing about 40 tables, treating of copper from almost every conceivable standpoint, has been fully revised and brought as nearly as possible to date.

The miscellaneous chapters of the book, 24 in number, treat of the subject of copper from a great variety of viewpoints, including the history, chemistry, mineralogy, metallurgy and uses of the metal, and this section of the book also has chapters devoted to substitutes, alloys, brands and grades, besides a copious glossary.

The Nova Scotia Steel & Coal Company.

At the annual meeting of the Nova Scotia Steel & Coal Company, with works at New Glasgow, Wabana and Sydney Mines, Nova Scotia, held March 30, the ticket of the management was elected by a vote ranging from 33,676 to 34,073 as against 31,500 for the ticket represented by Rudolphe Forget, of Montreal, who favored a more aggressive policy. President Robert E. Harris presented a statement comparing the results of operations in 1909 and 1904, the year before his presidency began. It made the following showing:

Year.	Earnings.	Output in tons.					
		Ore.	Coal.	Pig iron.	Steel.	Rolled.	Forged.
1909....	\$907,949	460,387	813,000	58,676	64,260	52,931	58,575
1904....	501,337	246,022	476,521	31,567	30,000	30,223	25,953
Increase, %	80	87	70	85	114	75	126

The president reported that the company had disposed of \$1,500,000 of its bonds in London and now had ample funds for improvements and extensions at New Glasgow, Wabana and Sydney Mines. There remains \$1,000,000 of treasury bonds, which it is not considered necessary to sell at present. The management expects an increase before the end of the year on the present dividend rate of 4 per cent. a year on the common stock. The statement added: "A stock bonus of 20 per cent. has compensated for the dividends which we considered it unwise to pay out during the years when we were using so large a proportion of our earnings for capital expenditure."

Standard Machine Builders Alive to Improved Methods.—Our Milwaukee correspondent notes an interesting development in the machinery trade. He says: "In the manufacture of standard machines there is a notable tendency this season to adopt the methods which have proved so successful in the works of the automobile builders and agricultural implement makers. Quite a number of superintendents and foremen now employed by Wisconsin manufacturers in other lines have been taken from the industries mentioned, and in every case which has come under the writer's observation their influence has been apparent in the improved layout of the work. The effect upon production is correspondingly noticeable. In one well-known establishment the output has been increased at least 25 per cent. with practically no additions to the equipment. The fact is one having considerable suggestive value for any manufacturer in the country who feels that his plant is not yielding as much as it should."

Labor Notes.

A large number of employees of the John Roebing Sons Company, Trenton, N. J., estimated in some accounts at 2000, went on a strike last week for an increase in wages. Laborers who had been receiving \$1.35 a day struck for \$1.50. The company is reported to be willing to make an increase to \$1.42 a day at once and to grant \$1.50 a day as soon as trade conditions warrant. Many of the men were willing to accept the offer, but meantime trade union organizers have been at work, and the strike is still on. It is stated that the company has sufficient stock on hand to fill orders for several weeks.

The threatened strike of building trades employees in New York City has been prevented, at least temporarily, and the indications are that a settlement of existing disputes will be reached. The building trades unions have recently had under consideration the proposal to call strikes on certain buildings one after the other in sympathy with the striking steam fitters who have been out since January 1. Action was postponed on intimation from the employers' association that further conferences were desired. There is a prospect that the matters at issue between the steam fitters and their employers will be adjusted.

The Maryland Steel Company, in view of the increased cost of living, has announced a 6 per cent. increase in the wages of its employees at Sparrows Point, Md., effective May 1.

The court at New Castle, Pa., has served an injunction against each of the former employees in the local tin plate plants of the American Sheet & Tin Plate Company, prohibiting them from interfering in any way with the workmen there employed. Last October a general injunction was granted against the striking tin workers, but this action means that a personal injunction has been served individually on each former employee that has not returned to work.

On April 1 all employees of the Bass Foundry & Machine Company, Fort Wayne, Ind., were given an advance of wages amounting to about 6 per cent.

The machinists employed in the shops of the American Locomotive Company, at Paterson, N. J., have organized as a branch of the International Association of Machinists. Other shops of the company are already organized. A new wage scale has been submitted at Paterson calling for an advance of 10 per cent., the abolition of the gang contract system, and the payment of a minimum wage of \$2.75 a day whether work is done by the day or by the piece.

Reports that the Youngstown Sheet & Tube Company had decided to give its employees a general advance of 10 per cent. in wages are incorrect and decidedly premature. This concern will be guided in this matter largely by such action as may be taken by other large steel interests.

The Wage Committee of the Amalgamated Association of Iron, Steel and Tin Workers will meet in Fort Wayne, Ind., in the week commencing April 25 to consider the wage scale that later will be presented to the delegates in convention. This Wage Committee will also confer in a short time with a committee from the Western Bar Iron Association, to go over the figures in the new wage scale covering puddling and finishing mills, which will be effective from July 1 next. It is stated that the Sons of Vulcan, composed of puddlers and muck rollers, will demand an advance of 12½ cents a ton this year, despite the fact that the wage scale of this organization for the past year has been 12½ cents a ton higher than the Amalgamated Association scale. In the past year there has been an increase in the number of new puddling furnaces, notably in the Mahoning Valley, the Girard Iron Company and Youngstown Sheet & Tube Company, both having built

a considerable number, while the former company is now engaged in building upward of 40 more.

The Pennsylvania Engineering Works Secures an Additional Bethlehem Contract.—The Pennsylvania Engineering Works, New Castle, Pa., which has blast furnaces, F. and G., for the Bethlehem Steel Company about half completed in its plant, has received an additional contract from the same company for replacing one of its old furnaces. It is known as Furnace A, and will be rebuilt complete. Work will start at once, and the furnace will be completed about October 1. The Pennsylvania Engineering Works has the 400-ton metal mixers for the Jones & Laughlin Steel Company and the Bethlehem Steel Company nearly ready for shipment. This week it is shipping to the Indiana Steel Company, Gary, Ind., special 65-ton transfer cars, and to the Hamilton Iron & Steel Company, Hamilton, Ohio, 45-ton hot metal cars. It recently installed in its own power plant a 150-hp. Erie City water tube boiler and an 18¾ x 21 in. Buckeye engine, direct connected to a 200-kw. Westinghouse generator.

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Trade Publications.

Sectional Base Heaters.—American Blower Company of New York, Detroit, Mich. Bulletin No. 273. Gives general description and specifications for the ABC sectional base heater for use in connection with fans and blowers for heating, ventilating and drying. Among the advantages claimed for this heater are greater amount of exposed surface, easy removal of pipes and sections without disturbing any other portion, and freedom from short circuiting and air binding.

Industrial Railways.—C. W. Hunt Company, West New Brighton, N. Y. Pamphlet No. 101; size, 3 1/4 x 8 in.; pages, 80. Contains a very comprehensive treatment of narrow gauge railway equipment for handling raw, partly finished or finished products in industrial establishments which gives the equipment its name. Everything from the tracks, which are furnished for laying in dirt, concrete floors or any other situation, to all kinds of cars and electric locomotives, are shown.

Steel Furniture and Specialties.—Kalamazoo Steel Goods Company, Kalamazoo, Mich. Catalogue No. 11. Treats of a line of steel stools, chairs, desks, book racks, tool racks, side tables, steel folding steps, hand cart, and an adjustable spring seat motorman's stool. This furniture is built with angle steel frames, riveted joints and hardwood seats. The advantages claimed for this type of construction are neatness, attractiveness, lightness and elimination of repairs.

Tool Steel and Babbitt Metal.—Joseph T. Ryerson & Son, Chicago, Ill. Two booklets. The first, which is No. 10 of "Ryerson's New Technical Library," contains a complete description of the various lines of high speed and carbon tool steels handled by this firm, together with directions for treating to insure the best results. Tables and general useful information for users of tool steel are appended. The second, No. 13, deals with the invention, function, properties, manufacture and application of Glyco babbitt metal. Data on its performance in actual practice and tests and descriptions of the various grades of Glyco products are included.

Exhaust Fans.—Backus Water Motor Company, 174 Pennsylvania avenue, Newark, N. J. Catalogue. Deals with the Backus line of exhaust ventilating fans. This includes exhaust ventilating wheels, disk fans and exhausters, rotating ceiling fans, a patent exhauster and wool dryer and a special pressure ventilating fan. The fans are regularly driven by a belt, or if desired they can be furnished for steam engine or electric motor drive. The illustrations include different types of fans and the use of the exhauster for drying malt and also for removing steam from bleacheries, dye houses and hat shops.

Lubricators.—Grapholl Lubricator Company, 90 West street, New York City. Catalogue. Describes the Grapholl line of lubricators which feed grapholite with each drop of oil. Some of the advantages claimed for these lubricators, which are made in a number of styles, are reduced oil consumption, increased horsepower, reduction in wear and tear on the engine and boiler, and effective lubrication under high temperatures, and even though the oil supply be temporarily interrupted.

Radial Drills.—The Cincinnati-Bickford Tool Company, Cincinnati, Ohio. Circular R 50. Shows the Bickford 2 1/2, 3 and 3 1/2 ft. plain radial drill. The new model of this machine has bronze bushed bearings, ball thrust bearings and a dial depth gauge. Tables of the dimensions of the three different styles of machine are appended.

Iron, Steel and Machinery.—Scully Steel & Iron Company, Chicago, Ill. Catalogue; size, 4 1/4 x 7 in.; 304 pages. Covers the entire line of iron, steel, heavy hardware, tool supplies and machinery carried by this firm, and is designed as a book of reference to supplement the regular monthly stock list. Tables of weights and other useful information are appended.

Electric Time Systems.—The Standard Electric Time Company, Waterbury, Conn. Catalogue No. 32. This is the company's 1910 catalogue describing and illustrating electric time systems and time plants for public or private buildings, industrial and commercial plants, schools, institutions and any other locations where time indications or automatic signals and time control can be employed. All the different appliances used with one of these systems, such as master and secondary clocks, time stamps, programme clock systems, street and tower clocks, employees' time registers and synchronizers, are all illustrated and described.

Valve Grinders.—The Ashcroft Mfg. Company, 85 Liberty street, New York City. Circular. Describes and illustrates the Ashcroft combined valve grinder, breast drill and ratchet for automobiles. This has been designed to meet the demand for a handy, light, compact, durable tool for service on automobiles to take the place of a number of separate devices. Although designed along the general lines of a breast drill, it has a number of other uses, as its name implies.

Iron and Steel Inspection.—Smith, Emery & Co., Inc., 651 Howard street, San Francisco, Cal. Booklet. Refers to the inspection work done by this firm of chemists and chemical engineers. This includes mill and shop inspection and construction supervision of structural steel work and inspections and tests of all sorts of material used in construction work and machinery and supplies of all kinds.

Valve Facing Tools and Valves.—The Draper Mfg. Company, Port Huron, Mich. Catalogue No. 6. Lists the different styles of valve facing tools, valve disks, brass balls, ball check valves, the Draper patented ball unions and the McGrath pneumatic locomotive turntable motor and flue welder.

Preservation of Iron and Steel.—The Zinc Coat Sales Company, Rochester, N. Y. Pamphlet. Devoted to a description of the Zink-Kote process for preserving iron and steel. This consists of coating articles heretofore protected from rust by galvanizing with pure zinc, which gives the process its name. One of the advantages claimed for this process is that it is a substitute for and a step in advance of nickel plating. Among the different articles which may be protected by this process are tools, cutlery, sheet metal and roofing and tempered articles of all descriptions.

Electrical Appliances.—General Electric Company, Schenectady, N. Y. Six bulletins. No. 4716 describes several types of the Thomson watt-hour meter. No. 4717, superseding No. 4586, is devoted to the use of the flame arc lamp for the lighting of streets and large interiors. No. 4719, superseding No. 4632, describes and illustrates fans suitable for use in the home, office or public building and also for ventilating purposes. No. 4720 describes the company's steam and air flow meters, which are made in both the recording and indicating types. No. 4721, superseding No. 4488, illustrates and describes the Thomson direct-current watt-hour meters. No. 4722, superseding No. 4555, enters more or less into the details of the electric drive in connection with the manufacture of Portland cement, and illustrates a number of installations.

Radial Power Hammer.—The Radial Power Hammer Company, Los Angeles, Cal. Catalogue A. Deals with a power hammer which may be operated in any desired position throughout an arc of 180 deg. The advantages claimed for this tool are that not only may a greater variety of work be done on this hammer, but one blacksmith without a helper can do all of it provided the material is not too heavy for him to handle unassisted. This gives an estimated increase in the output per smith of 30 per cent, and a similar saving in the amount of coal used, together with the saving in wages for one helper for all the time and two helpers a part of the time. An illustrated description of this hammer was printed in *The Iron Age* April 7, 1910.

Spark Arresters.—The South Bend Spark Arrester Company, Sample and Fellows streets, South Bend, Ind. Catalogue and price-list No. 10. Treats of four styles of spark arresters for use on portable and traction thrasher engines, portable and stationary mill engines, railroad locomotives, road traction engines and hoisting engines. These arresters can be used on engines burning either wood, coal or straw.

Magnetos.—Remy Electric Company, Anderson, Ind. Three circulars. Two relate to two types of alternating-current magnetos for use on automobiles. The third deals with the type W 2 magneto igniter for use with large engines where it is impossible to turn the engine quickly for starting, or where the engines are started by pulling back against compression and operating the spark by hand.

Cranes.—The Euclid Crane & Hoist Company, Euclid, Ohio. Catalogue. Illustrations and descriptive matter explain the operation of a line of electric and hand power traveling cranes, electric hoists and jib cranes, overhead trolley systems and trolleys, and hoisting and bucket operating machinery for power plants and docks.

Electric Motors and Generators.—Western Electric Company, 463 West Street, New York. Two bulletins, No. 5132, replacing No. 5112, issued January, 1908, illustrates and describes the Hawthorn type EC belt-driven generator, for use in small steam-driven electric plants. No. 5360 takes up the subject of Hawthorn small power motors and describes very completely types of small alternating and direct current motors ranging from 1-30 to 1-6 hp., suitable for various purposes such as buffing and grinding wheels, sewing machines, meat grinders and other household machines which require little power to operate.

Storage Battery Wagons.—The Lansden Company, Newark, N. J. Pamphlet. Pertains to a line of electric wagons and trucks equipped with Edison storage batteries. The different models include delivery wagons, platform trucks and small three and four wheel industrial trucks for factory and short haul use. *The Iron Age* April 7, 1910, contained an illustrated description of these industrial trucks. All the different models are illustrated and there is a table giving the load capacity, miles per charge of battery, speed, complete weight and the weights of the different parts. A list of prominent users of the Lansden wagons is appended.

Punching and Shearing Machines.—McSherry Mfg. Company, 122 Ninth street, Pittsburgh, Pa. Folder calls attention to the Vulcan combination shear, punch and bending machine and the Hercules shear. These machines will handle all shapes of metal of customary sizes. A number of different sizes and shapes of dies are furnished with each of the machines, so that a great variety of work can be done and straight or curved cuts can be taken.

CURRENT METAL PRICES.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL— Bar Iron from store—

Refined Iron:	
1 to 1 1/2 in. round and square.....	\$ 1.90¢
1 1/2 to 4 in. x 3/4 to 1 in.....	\$ 2.10¢
1 1/2 to 4 in. x 1/4 to 3/16.....	\$ 2.10¢
Rods—3/8 and 11-16 round and square.....	\$ 2.10¢
Angles:	
3 in. x 1/4 in. and larger.....	\$ 2.10¢
3 in. x 3/16 in. and 1/4 in.....	\$ 2.35¢
1 1/2 to 2 1/2 in. x 1/4 in.....	\$ 2.20¢
1 1/2 to 2 1/2 in. x 3/16 in. and thicker.....	\$ 2.10¢
1 to 1 1/2 in. x 3/16 in.....	\$ 2.20¢
1 to 1 1/2 in. x 1/4 in.....	\$ 2.40¢
3/4 x 1/4 in.....	\$ 2.50¢
3/4 x 1/4 in.....	\$ 2.50¢
3/4 x 3/32 in.....	\$ 2.55¢
Tees:	
1 in.....	\$ 2.65¢
1 1/2 in.....	\$ 2.65¢
1 1/2 to 2 1/2 x 1/4 in.....	\$ 2.15¢
1 1/2 to 2 1/2 x 3/16 in.....	\$ 2.35¢
3 in. and larger.....	\$ 2.15¢
Beams.....	\$ 2.10¢
Channels, 3 in. and larger.....	\$ 2.10¢
Hande—1 1/2 to 6 x 3/16 to No. 8.....	\$ 2.35¢
"Burden's Best" Iron, base price.....	\$ 2.10¢
Burden's "H. B. & S." Iron, base price.....	\$ 2.25¢
Norway Bars.....	\$ 3.00¢

Merchant Steel from Store—

Bessemer Machinery.....	per lb	\$ 1.90¢
Toe Calk, Tire and Sleigh Shoe.....		\$ 3.50 to \$ 3.00¢
Best Cast Steel, base price in small lots.....		\$ 7¢

Sheets from Store—

Black	One Pass, C.R.	R. G.
	Soft Steel	Cleaned.
No. 16.....	\$ 2.90¢	\$ 3.00¢
No. 18 to 21.....	\$ 3.10¢	\$ 3.10¢
No. 22 and 24.....	\$ 3.00¢	\$ 3.20¢
No. 26.....	\$ 3.10¢	\$ 3.30¢
No. 28.....	\$ 3.20¢	\$ 3.50¢

Russia, Planished, &c.,

Genuine Russia, according to assortment.....	\$ 12 @ 14 1/2¢
Patent Planished, W. Dewees Wood.....	\$ 10 A, 10¢; B, 9¢ net

Galvanized.

Nos. 14 to 16.....	\$ 3.20¢
Nos. 22 to 24.....	\$ 3.55¢
No. 26.....	\$ 3.75¢
No. 28.....	\$ 4.10¢
No. 30 and lighter 36 inches wide, 25¢ higher.....	

Genuine Iron Sheets—

Galvanized.	
Nos. 22 and 24.....	\$ 5.75¢
No. 26.....	\$ 6.25¢
No. 28.....	\$ 7.25¢

Corrugated Roofing—

2 1/2 in. corrugated.	Painted	Galv.
No. 24.....	\$ 100 sq. ft. \$3.55	4.50
No. 26.....	\$ 100 sq. ft. 2.85	4.00
No. 28.....	\$ 100 sq. ft. 2.60	3.75

Tin Plates—

American Charcoal Plates (per box.)	
"A.A.A." Charcoal:	
IC, 14 x 20.....	\$6.35
IX, 14 x 20.....	7.60
A. Charcoal:	
IC, 14 x 20.....	\$5.40
IX, 14 x 20.....	6.50

American Coke Plates—Bessemer—

IC, 14 x 20.....	\$4.40
IX, 14 x 20.....	5.40

American Terne Plates—

IC, 20 x 28 with an 8 lb. coating.....	\$8.50
IX, 20 x 28 with an 8 lb. coating.....	10.50

Bolts—

Carriage, Machine, &c.—

Common Carriage (cut thread):	
3/4 x 6 and smaller.....	70¢ 1/2¢
Larger and longer.....	65¢ 5¢
Common Carriage (rolled thread):	
3/4 x 6, smaller and shorter.....	70¢ 12 1/2¢
Phila. Eagle, \$3.00 list.....	80¢ 5¢ 10¢
Bolt ends with C. & T. Nuts.....	65¢ 5¢
Machine (Cut Thread):	
3/4 x 4 and smaller.....	70¢ 12 1/2¢
Larger and longer.....	65¢ 10¢

Nuts

Blank or Tapped.	
Cold Punched:	Off list.
Square.....	4.90¢
Hexagon.....	5.50¢
Square, C. T. & R.....	5.50¢
Hexagon, C. T. & R.....	6.10¢
Hot Pressed:	Off list.
Square.....	5.40¢
Hexagon.....	5.90¢

Seamless Brass Tubes—

List November 13, 1908.....	Base price 18¢
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Brass Tubes, Iron Pipe Sizes—

List November 13, 1908.....	Base price 18¢
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Copper Tubes—

List November 13, 1908.....	Base price 22¢
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Brazed Brass Tubes—

List August 1, 1908.....	20 1/2¢ per lb
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High Brass Rods—

List August 1, 1908.....	15 1/4¢ per lb
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Roll and Sheet Brass—

List August 1, 1908.....	15 1/4¢ per lb
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Brass Wire—

List August 1, 1908.....	15 1/4¢ per lb
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Copper Wire—

Base Price.....	Carload lots mill 14 1/2¢
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Copper Sheets—

Sheet Copper Hot Rolled, 16 oz (quantity lots) \$ 18	
Sheet Copper Cold Rolled, 1¢ per lb advance over Hot Rolled.....	
Sheet Copper Polished 20 in. wide and under, 1¢ per square foot.....	
Sheet Copper Polished over 20 in. wide, 2¢ per square foot.....	
Planished Copper, 1¢ per square foot more than Polished.....	

METALS—

Tin—

Straits Pig.....	\$ 34 1/2 @ 35¢
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Copper—

Lake Ingot.....	\$ 14 1/2 @ 15¢
Electrolytic.....	\$ 14 1/2 @ 15¢
Casting.....	\$ 14 1/2 @ 14 1/2¢

Spelter—

Western.....	\$ 6 1/2 @ 6 1/2¢
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Zinc.

No. 9, base, casks.....	\$ 8 1/2 @ 8 1/2¢
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Lead.

American Pig.....	\$ 5 1/4 @ 5 1/4¢
Bar.....	\$ 6 1/4 @ 6 1/4¢

Solder.

1¢ & 1/2, guaranteed.....	\$ 22 1/2 @ 23 1/2¢
No. 1.....	\$ 18 1/2 @ 19 1/2¢
Refined.....	\$ 17 1/2 @ 17 1/2¢
Prices of Solder Indicated by private brand vary according to composition.....	

Antimony—

Cookson.....	\$ 10 @ 10¢
Halletts.....	\$ 10 @ 10¢
Other Brands.....	\$ 9 1/2 @ 9 1/2¢

Bismuth—

Per lb.....	\$2.00 @ \$2.25
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Aluminum—

No. 1 Aluminum (guaranteed over 99% pure), in ingot for remelting.....	\$ 34 @ 34¢
Rods & Wire.....	Base Price 31¢
Sheets.....	Base Price 33¢

Old Metals.

Dealers' Purchasing Prices Paid in New York	Cents
Copper, Heavy cut and crucible.....	\$ 11.25 @ 11.50
Copper, Heavy and Wire.....	\$ 10.75 @ 11.00
Copper, Light and Bottoms.....	\$ 9.75 @ 10.00
Brass, Heavy.....	\$ 7.50 @ 7.75
Brass, Light.....	\$ 6.00 @ 6.25
Heavy Machine Composition.....	\$ 10.00 @ 10.25
Clean Brass Turnings.....	\$ 7.00 @ 7.25
Composition Turnings.....	\$ 8.25 @ 8.50
Lead, Heavy.....	\$ 3.50 @ 3.75
Lead, Tea.....	\$ 3.25 @ 3.50
Zinc Scrap.....	\$ 2.00 @ 2.25

THE IRON AGE

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Boston.....	Compton Building, 161 Devonshire Street
Cleveland.....	The Cuyahoga, 216 Superior Avenue, N. E.

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